

MARINE REVIEW.

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No. 21.

Ore Sales—Lake Freight Matters.

If we include the Mesabi ores that will be taken by the Carnegie Steel Co. and the Illinois Steel Co. under special contracts, as well as ores that are provided for by manufacturers who are interested in mining companies, the total sales to date will probably foot up close to 6,000,000 tons, and yet there seems to be even more delay than there was a month ago in everything pertaining to the lake business of the present season. Only one block of ore, 150,000 tons, has been covered by lake freight contracts during the past week. It is to be moved from the head of the lakes, and about half of it was contracted at 70 cents for the full season with the balance at 60 cents to Sept. 1. As an indication of the capacity of vessels now controlled by the ore companies, it may be noted that at least two of these companies that are unable to provide for their own vessels were applicants for the ore above referred to, and at the rates stated. Vessel owners are beginning to realize the great effect of deep water from Lake Superior, which is in many cases increasing the capacity of vessels full 20 per cent. over last spring, and it is on this account that so many of them are anxious to make ore contracts on the basis of 70 cents from the head of Lake Superior. It must be admitted, however, that the proportion of the lake fleet still out of commission is very large, and this condition will certainly have a marked effect on the business that must be crowded into the latter part of the season. But few of the large interests seem to have any regard for this view of the future, and the lake freight market as far as single trip charters for ore is concerned shows no improvement. Single trip engagements do not amount in number to more than three or four daily and the market is weak at 60 cents from the head of the lakes, 50 cents from Marquette and 40 cents from Escanaba. Quite a large fleet of vessels is now bound to the head of the lakes without charters for return cargoes, and if ore shippers were so disposed they could very probably reduce the rate which these vessels must accept on return trips.

Detroit River Currents.

Some time ago, while the barge Geo. E. Hartnell was in tow of a steamer passing up Detroit river, and just after passing the Lime-Kiln crossing light-vessel (south), she was struck by what Capt. Jones thinks was a cross current, and swung across to the east (Canadian) bank, where she struck about midway between the south and north light vessels. The barge Arenac and other vessels have had a similar experience. Capt. Jones suggests that vessels in tow shorten up on the tow line and the towing steamer keep well to the west side, when passing this point with large barges deeply laden. A little farther up the river, the current sets in a directly opposite direction. About one mile above the Lime-Kiln crossing light-vessel (north), and approximately half-way between it and Ballard's reef light-vessel, the set of the current is westerly. This information is from a report submitted to the branch hydrographic office at Cleveland by Capt. John F. Jones of the Hartnell.

Holland Submarine Boat.

The Holland submarine torpedo boat, launched at Elizabeth, N. J., Monday, and christened Holland, is cylindrical, 50 feet 3 inches long, with a 4-foot screw-protecting extension. The diameter is 10 feet 3 inches amidships; moulded diameter is the same. It is expected that this vessel will travel under water 8 knots an hour for eight hours and 10 knots an hour on the surface. Power comes from a gasoline engine and a dynamo, the former to be used when the boat is sailing along the surface and the latter when submerged. It will take less than a minute to submerge and about the same length of time to rise. Armament consists of three torpedo tubes, to discharge high explosives. Six men will constitute the crew. A similar vessel is being built under a special appropriation made by the United States government, but this one is for sale.

The Review has excellent photographs of lake ships.

Grain and Flour Business at Cleveland.

Alike to all of the other railway lines tributary to the lakes, the C. C. C. & St. L. Co. (Big Four) is making an effort to increase its grain and flour business, and a new elevator and flour storage handling plant now being erected by this company will again place Cleveland among the grain ports of the lakes. The elevator, which is being erected on what is known as the Cincinnati slip, will be of 500,000 bushels capacity, and will be operated by the Cleveland Grain Co., of which C. G. Watkins of Sheldon, Ill., is president, and C. B. Congdon of Chicago is secretary. The principals of this company are men fully acquainted with the grain business, and they have entered into close relations with the railway company and the Cleveland Steel Canal Boat Co. in undertaking the Cleveland enterprise. They expect to handle 25,000 cars of grain annually. A large part of this grain will be moved from Cleveland to New York in the vessels of the canal boat company, as it is intended to fill up the canal boat fleet at all times when other freight is not offering. The slip on which the elevator is being built is 650 feet in length and is to be deepened immediately to 18 feet. The side of the slip not occupied by the elevator is to be used by the canal boat company for its general business.

In connection with this grain business, the Big Four company is also rebuilding the docks and warehouse on the site of the old Merwin street depot for handling flour in large quantities. The flour business is to be secured through the traffic arrangement announced some time ago between northwestern roads and President Ingalls, representing the Chesapeake & Ohio and Big Four companies. The northwestern roads are the Chicago & Northwestern, Illinois Central and Wisconsin Central. These roads are to deliver flour at Manitowoc to the Gordon line of steamers, which will bring it to Cleveland. From Cleveland it will go over the Big Four and Chesapeake & Ohio to Newport News, where it will be shipped in vessels of the C. & O. company to Liverpool, thus affording a through bill of lading from points of original shipment to foreign consumers. Work on fitting up the warehouse for this flour business is now under way and is being pushed rapidly.

It is understood that Mr. C. E. Wheeler of the Cleveland Steel Canal Boat Co. has had a great deal to do with bringing together the interests that have combined to build up these new enterprises. The canal boat company has also been an important factor in developing Cleveland business in other lines, especially an export trade that was unthought of a short time ago. Full 90 per cent. of the canal boat business east bound has been for export. They now have under way shipments of 553 tons of nails that are being forwarded to Japan by the H-P Nail Co. They also have 100 tons of wire for Buenos Ayres. The canal boats have also enabled the Cleveland City Forge & Iron Co. to build the big rudders which they have under way for the battleships Kearsarge, Kentucky, Illinois and Alabama, building at Newport News and Philadelphia. These big iron forgings, weighing twenty-five tons each in the rough, are so large that they can not be shipped over a railway, on account of bridge and tunnel obstructions, but the Cleveland concern secured the contract through an arrangement with the canal boat company to take them by lake and canal to New York, where they will be transferred to ocean vessels for shipment to the coast ship yards.

Col. G. J. Lydecker opened bids at Detroit recently on three dredging jobs at Belle river, Clinton river and Black river, and the work was secured by E. H. Hall of Detroit, whose bids are certainly remarkably low as compared with those of his competitors. The price per yard, scow measure, bid by the different firms were as follows: On Black river, Hall, 8 cents; Carlin & Cram, Detroit, 25 cents; McCullom & Lee, Port Huron, 24 cents, and James Rooney, Toledo, 14 cents; on the mouth of the Black river, 10, 28, 29½ and 21 cents, respectively; on the Belle river, 11, 20, 24 and 14 cents, respectively; and on Clinton river, 15, 24 and 18 cents, McCullom & Lee not bidding.

"The Ship is the Source and Limit of Liability."

Two proceedings recently brought in the United States district court at Cleveland, to limit the liability of the owners of vessels in negligence cases, have occasioned comment in the daily press, and inquiries in reference to the proceedings seem to justify a brief statement of the law. The practice in limiting liability abounds in technical niceties, but is only of interest to the proctor; the scope of the law and its policy are of general interest, and seem not to be understood except by those who have invested their means in vessel property.

In brief, the statutes provide as follows: Liability for loss or damage to "any merchandise whatsoever" by fire, "unless caused by the design or neglect of such owner," is exempted; for any embezzlement, loss or destruction by any person of any property, goods or merchandise "without the privity or knowledge" of the owner, the liability of each owner is limited to the value of his interest in the vessel and her freight then pending. By the act of 1884, it is provided "that the individual liability of a ship-owner shall be limited to the proportion of any and all debts and liabilities that his individual share of the vessel bears to the whole; and the aggregate liabilities of all the owners of a vessel on account of the same shall not exceed the value of such vessel and freight pending." By the original acts, canal boats, barges or lighters, and vessels of any description used in river or inland navigation, were excluded from the benefits of the law, but by the act of 1886 it is expressly provided that the law shall apply "to all sea-going vessels, and to all vessels used on the lakes or rivers, or in inland navigation, including canal boats, barges and lighters."

In construing these acts, the courts have determined that the value of the interest to which the liability is limited is the value after the accident and not before; that they apply to personal injury and death claims; that the limitation is not general in time, but must be assigned reasonably, to the claims arising during a single voyage, valuing the interest on the termination of the voyage, and if the vessel be wrecked before completion of the voyage, then from the value of the wreck must be deducted the cost of raising or salving the vessel. It has also been held that in valuing an interest in a wrecked or damaged vessel, the insurance indemnity of the owner need not be included, that arising by personal contract of the owner and being severable from the ship. Whether, in a case of collision, or any claim giving to the owner a right to proceed against another vessel or person, to recover any part of damages done to the vessel by the same accident which gave rise to claims against which the owner's liability is sought to be limited, such right to recover must be surrendered or appraised as part of the value of the vessel, has not been determined. If an opinion were ventured, it would be in the negative. When an owner applies for limitation of his liability, it is of no consequence that actions are pending in other courts, state or federal. The proceedings to limit liability being instituted in the proper district court, (the only court competent to give the relief), the fifty-fourth rule of admiralty provides for an injunction against "the further prosecution of all and any suit against said owner in respect of any such claim."

Early in the present century, Maine and Massachusetts enacted laws having, in general, the scope as above stated, and in 1851 the first general statute was passed by congress. By such enactment, and the amendatory and supplemental acts, congress did nothing more than give recognition to "the old maritime rule administered in courts of admiralty in all countries except England from time immemorial." Concerning the acts, our supreme court in an early case said:

"The great object of the law was to encourage ship building and to induce capitalists to invest money in this branch of industry. Unless they can be induced to do so, the shipping interests of the country must flag and decline. Those who are willing to manage and work ships are generally unable to build and fit them. They have plenty of hardiness and personal daring and enterprise, but they have little capital. On the other hand, those who have capital, and invest it in ships, incur a very large risk in exposing their property to the hazards of the sea, and to the management of seafaring men, without making them liable for additional losses and damage to an indefinite amount. How many enterprises in mining, manufacturing and internal improvements would be utterly impracticable if capitalists were not encouraged to invest in them through corporate institutions by which they are exempt from personal liability, or from liability except to a limited extent? The public interests require the investment of capital in ship building, quite as much as in any of these enterprises."

This is substantially the ground assigned when the rule was

adopted in part in England (7 George II, 1734), that act reciting that it was of the greatest consequence to the kingdom to promote the increase of the number of ships and to prevent any discouragement to merchants from becoming interested therein. Grotius' War and Peace, Book 2, C. C. II, Sec. 13, says that men would be deterred from investing in ships if they thereby incurred the apprehension of being rendered liable to an indefinite amount by the acts of the master. The common law of England and the civil law of Rome each imposed upon carriers the responsibility of insurers. Nothing less was deemed sufficient to prevent collusion with thieves. On land the owner could in a measure supervise; but once out of port, all the owner's supervision over ship and crew was at an end. On land the government could protect, but against the perils of the seas protection of government was of no avail. If the same severe rule must be applied to carriers by sea, the ship owner must risk many times the value of his ship, and that when impossible to exercise supervision or have the ordinary protection offered land carriers. To lessen the risk of absolute ruin and encourage sea ventures, a limitation of the liability was necessary. Another consideration was not without weight. The practical impossibility of ascertaining the ownership of vessels, and the reluctance of nations to send their people into foreign jurisdictions to seek the owners and compel redress from them, gave ready acceptance to the proceeding *in rem* of the civil law; to proceed against the ship herself, treating the ship as the offender and compelling redress from her wherever found, regardless of her ownership or nationality. The correlative of this right must have been apparent at once. If the damnified one could have redress from the offending ship wherever found, whether at the time of the commission of the wrong she were being navigated by agents of the owner or of a stranger, even justice would dictate some limit to the liability. The ship is the source, why not the limit?

A source not in complete consonance with the foregoing has been assigned. The object of the Greek and early Roman process was vengeance on the immediate cause of the offence, not indemnity from the master or owner. In early Greek customs the process was directed in terms against the object, whether animate or inanimate. The liability seemed to attach to the body doing the damage and end there. So it was that if a tree fall upon a man or a man fall from a tree and is killed, in either case, the tree must be delivered up to the relatives of the deceased or chopped to pieces. King Alfred ordained the surrender of a tree. Later a man's death ceased to be the private affair of his friends, and the king exacted the penalty. If a man fell from a ship and was drowned, the motion of the ship was taken as the cause, and the ship forfeited. When the owner of the offending thing was made defendant, the ground of liability was not changed, but the owner was permitted to make payment and protect his interest, as now he must surrender his ship or pay the value. Whether the proceeding *in rem* as known to maritime law, and the limiting of liability to the ship, had their beginning in this primitive notion of vice in the offending thing and its owner being quit on its destruction or surrender, let others determine. It has the support of reputable authority.

What people first adopted the policy, and when, is uncertain, but by the close of the middle ages, when the whole world seemed turning to the sea, it was generally established. The celebrated Ordonnance de la Marine (Louis XIV., 1681), which, on ordination "at once became the universal law of maritime nations," and which was founded upon all the ancient and modern maritime codes, in the light of particular information of the actual maritime practice of all Europe at the time, evidencing the universality of the policy, provided (sec. II. title fourth) that owners should be discharged on abandoning ship and freight.

The acts are not mere municipal regulations, but regulations of commerce, available alike to citizens and foreigners, and in their application are liberally construed in the interest of what should be the subject of most solicitous care, the advancement of commerce. The doctrine has been too long established, attested by too great an array of able jurisconsults, and is supported by too many cogent policies of governmental economics to be seriously questioned now. These acts and the Harter law are the only practical "encouragements" to the merchant marine found in our laws, and they have not been sufficient to prevent the humiliating spectacle of a nation, whose opportunity to hold unquestioned empire of the sea has never been surpassed, if equalled, standing among the maritime giants of the world a pigmy, shaved, shriveled and shorn, paying millions in annual tribute for the privilege of permitting her commerce to be carried in the ships of any people but her own.

A Final Limit of About 17 Feet.

If the new Poe lock and all improvements in the Sault river were entirely completed at this time, including the clearing up of even the small lumps that are found by the sweeping process, there would be no possibility of vessels passing through the American canal with a greater draft than 17 feet. The limit of 17 feet is due to the sill of the movable dam, or guard gate, above the locks, which was constructed for the protection of the Weitzel lock, and which must be rebuilt in order to allow vessels navigating the canal to take full advantage of the draft afforded by the new Poe lock. Vessel owners are accordingly asking why provision was not made for a new movable dam, or guard gate, to be in readiness with the completion of other improvements. They are not entering complaint very earnestly, however, as only vessels of the largest type would derive immediate advantage from a draft of 17 feet or more at any time this season, and the deep water has already had an effect on freights that is startling enough to most owners.

Col. Lydecker is quoted as saying that the dam above the locks must remain as it is for the present season, at least. It follows, therefore, that no matter what the available depth of water may be at the Neebish and Encampment, where most difficulty has been encountered in the past, there is considerable doubt of full 17 feet draft being afforded through the United States canal at any time this season. The 17-foot mark, or even an addition of several inches on that figure, may possibly be attained later on, if there is an improvement in water conditions, by vessels using the Canadian canal.

The movable dam, which is now an obstruction in the United States canal, was built at a cost of \$95,000, and was placed in position simultaneously with the completion of the Weitzel lock. It is designed to serve as a safeguard in case of an accident of any kind that might carry away the lock gates. By means of this gate the rapid flow of water that would follow such an accident could be shut off, but there has been no occasion to use it at any time since it was built. It is said that plans for a new safeguard of this kind have been prepared, and that it will consist of a set of gates similar to those in use at the new canal, which will be kept closed when the locks are in operation.

Defending the Canal Officials.

The Review of May 6 contained a letter from Capt. Buie of the Wilson line steamer Yuma, in which it was stated that his vessel, while bound down from Lake Superior, April 30, with a cargo of grain, struck on the sill of the movable dam above the locks in the Sault canal, and fetched up again in the center of the channel at the foot of the new lock. Capt. Buie said the accident to his vessel on the sill of the movable dam was due to the filling of the lock, and his letter otherwise contained a severe criticism of the condition of the new canal works at the Sault. In view of these facts there is submitted herewith a correspondence which Col. G. J. Lydecker sends to the Review in answer to Capt. Buie's letter. The complaint was submitted by Col. Lydecker to Mr. E. S. Wheeler, general superintendent of the canal, and his answer is as follows:

"I have the honor to acknowledge the receipt of your letter of May 3, inclosing copy of letter from Capt. Thomas Wilson concerning shoal at lower end of Poe lock and the sill of movable dam; also extract from letter of Capt. Buie. I have examined the matter and find that the Yuma did rub heavily on the sill of the movable dam. The low water at this time was not caused wholly by the filling of the lock, since this was done before the Yuma reached the movable dam and long enough so that the oscillations must have nearly ceased. There were, however, on this day fluctuations in the water level in the canal caused by outside influences and amounting to as much as 2 feet. Capt. Buie tried to cross the sill when the water was low. On the first trip of the Yuma Capt. Buie had been fully instructed by Supt. MacKenzie not to go on the sill when he saw the water was low. Foreman McDonald heard and remembers the conversation. Capt. Buie disregarded his instructions and went on the sill when he could plainly see that the water was low. The Yuma also grounded on the shoal at the foot of the lock. When she was starting out of the lock, Asst. Supt. Rains, who was on duty, told Capt. Buie to keep close to one or the other of the piers, so as to avoid the shoal in the middle. Supt. MacKenzie stood by and heard the order. Capt. Buie paid no attention to it, kept exactly in the middle and struck the shoal. It is very probable that Capt. Buie had been notified of this shoal several times before. I observe that Capt. Buie does not say in his letter that he was not notified concerning this shoal, but he evidently wishes to have

the inference drawn that he was not notified. There are probably others of the lock force besides Capt. MacKenzie who heard Mr. Rains warn the captain of the shoal, not five minutes before he ran onto it. I enclose herewith the reports of Supt. MacKenzie and Asst. Supt. Rains."

Supt. MacKenzie's report, which is referred to in the last sentence of Mr. Wheeler's letter, is as follows: "In regard to the steamer Yuma striking on the sill of the movable dam on her way down, April 30, I have the honor to state that the steamer reported at the west end of canal at 11:45 a. m. and left the lock at 12:20 p. m. On that date the wind was from the east, and an east wind causes low water in the canal, varying according to the strength of the wind. Below the lock the variation is from 3 to 6 inches and above the lock from 1 to 2 feet. The water rises and falls suddenly, which was the case that day. I was on the lock at the time it occurred. The lowering of the water was not caused by the filling of the lock, as the lock was filled before the steamer reached the movable dam. The captains have all been notified of the change in the water caused by the filling of the lock, ever since it was discovered, and also of the shoal in the middle of the canal below the lock, and told to keep close to either north or south pier until the shoal would be dredged out, according to your instructions to me. It was explained to the captain of the Yuma by me both last fall and this spring. At all times when there are vessels in the vicinity of the bridge the lock has been filled with only two valves to prevent a sudden fall of water. I was standing close by and heard Asst. Supt. Rains direct the captain of the Yuma to keep close to the pier when going out, as there was a shoal in the center of the channel just below."

Mr. Wheeler also submits the report of Asst. Supt. H. D. Rains, which is as follows: "I have the honor to make the following report in regard to the striking of the steamer Yuma above and below the lock, on April 30. On that date the wind was in the east and the water was extremely low, which was the cause of her striking the sill of the movable dam, above the lock, and not by the filling of the lock. As to her striking below the lock, I notified the captain to keep close to one of the piers, as there was a shoal in about the center of the channel."

Against High Speed in Lake St. Clair Cut.

Editor of the Marine Review:—Considerable complaint has been made regarding the movements of vessels through the improved 20-foot channel in Lake St. Clair, especially as respects speed. This dredged cut has a uniform width of but 800 feet, with soft bottom and sides, and the practice of running through it at high speed threatens the durability of the improvement, as well as the safety of navigation. The question of promulgating restrictive regulations has recently been under serious consideration, but the secretary of war has now advised me that he hopes a cautionary notice to vessel owners and masters against high speed in this cut may be all that is necessary to secure their co-operation in this matter, and thereby protect the interests of a navigation in which they are so deeply concerned

G. J. Lydecker,
Detroit, Mich., May 14, 1897. Lt. Col. of Eng'rs. U. S. A.

The Marine Review has prepared in neat oak frames cards containing the schedule of time required to be run between certain points in the St. Mary's river under the speed limit of seven miles an hour. When hung in a pilot house, distance and time may be readily noted from these cards, as the type is large. They will be sent by express to any address at \$1 each, or may be had upon application at 409 Perry-Payne building, Cleveland, for 65 cents each.

Polynesia is the name selected for the steel tow barge which the Globe Iron Works Co. of Cleveland is building for James Corrigan of Cleveland. A vessel of the same name owned by Mr. Corrigan was lost on Lake Michigan in 1887. She foundered while bound down Lake Michigan with a cargo of coal in tow of the steamer Raleigh. The crew was saved by men from the Raleigh.

Located on the south shore of Lake Erie, contiguous to the Nickel Plate road, are many country homes that will accommodate summer boarders. Send to B. F. Horner, general passenger agent of the Nickel Plate road at Cleveland, O., and he will forward you a list on receipt of a two cent stamp.

56 Jul 15

Around the Lakes.

An extension of the Lake Superior & Ishpeming Railroad to the Queen mine at Negaunee will be opened up in a couple of weeks.

The Crescent City's big cargo of oats, taken from Duluth to Buffalo, is reported to have weighed out 318,000 bushels. This is equal to 5,088 net tons.

Canada's legislators are disposed to do away with laws closing the canals on Sunday, but the question of open or closed canals is not as yet fully settled.

It was feared that appropriations in the postoffice department would not be sufficient to permit of the continuance of free delivery to vessels passing Detroit, but department officials have figured out enough to care for the service until July, when new appropriations will be forthcoming.

Rules proposed by Col. Jared A. Smith, United States engineer, for the regulation of navigation in Toledo straight channel are very nearly the same as the St. Clair Flats canal rules. They have been submitted to the secretary of war but have not as yet been approved by that official.

Citizens of Kingston, who have been talking of a new elevator for a long time past, are now expecting that capitalists of Chicago, Duluth and Toronto will join them in the enterprise. Electors of the city of Kingston will on June 16 vote on a proposition to give the elevator company a bonus of \$25,000.

The Sault Ste. Marie News announces the death at that place from paralysis of Capt. Henry G. Johnston, who had sailed the lakes for years and held master's papers. Capt. Peter Cronley, for many years a well-known master of sail vessels, died at Oswego on Wednesday at the age of 67 years, also from the effects of a stroke of paralysis.

It is understood that members of the firm of Pickands, Mather & Co., Cleveland, who have probably had more to do with the building of steel vessels than any other owners on the lakes, are especially pleased with the new steel barge Constitution, built by the American Steel Barge Co., and which has just delivered at Cleveland her first cargo of ore.

Three weeks ago, when the steamers Minneapolis and St. Paul were launched at the yard of the Chicago Ship Building Co., the frames for the water bottom of the new Corrigan barge Amazon were not all in place, but the work on the vessel, which has since been the only new craft under way in the yard, was pushed so rapidly that she was launched on Wednesday last.

It is expected that the steamer Escanaba, which is now undergoing extensive alterations at the works of the Milwaukee Dry Dock Co., will be engaged in the new B. & O. line between Chicago, Milwaukee and Fairport. Two gangways are to be cut in each side of the vessel and the loss of strength thus occasioned is to be overcome by the introduction of a steel arch over each gangway.

The first heavy losses of the season on steel vessels are divided among the big insurance interests. It is understood that insurance on the Katahdin, which has just finished repairs at West Superior, was placed through the McCurdy Prime combination of Chicago, while that of the Cadillac was placed through Mather & Co., brokers of Philadelphia. The Cadillac loss is the heaviest of the season thus far. Forty plates have been removed from her bottom and she will be in dock about two weeks. About twenty-five plates were damaged in the Katahdin.

One of James Davidson's new wooden tow barges, the Crete, launched on Saturday last, had sails bent and was entirely ready for service when she went into the water. A duplicate vessel, the Athens, will be launched in a few days. These vessels are 300 by 45½ by 34 feet. They are classed by the United States Standard Register. They are fitted with steam windlasses and capstans, steam deck hoists, steam pumps and steam towing machines built by the American Ship Windlass Co. They are also supplied with stockless anchors and their outfit as a whole is similar to that of the largest steel steamers.

An artistic brochure entitled "Summer Outings" is published by the Nickel Plate road, describing vacation resorts along that line. Address B. F. Horner, general passenger agent, Cleveland, O., for a copy.

55 Jul 15

Appointments of captains and engineers for 1897, vest pocket size, \$1.00. Order from the Marine Review, Cleveland, Ohio.

Speed and Cargo Records—Lake Freight Steamers.

Newspaper reports from Duluth regarding big wheat cargoes loaded by the steamer Queen City have been incorrect. The largest cargo of any kind moved from Lake Superior thus far is that of the Andrew Carnegie, just loaded, which foots up 182,760 bushels, or 5,482 net tons. The largest ore cargo from Lake Superior has been delivered by the Bessemer line steamer Siemens. Including 1 per cent. allowed for moisture, the Siemens' cargo, which was carried on a draft of 16 feet 1 inch, foots up 4,810 gross or 5,387 net tons. The report that the steamer James Watt of the Bessemer fleet had loaded 5,550 tons of coal in Cleveland recently was incorrect. Coal cargoes are always short, and it was so with the Watt. She loaded only 4,868 tons. It is quite probable that the largest coal cargo ever moved on the lakes is that of the barge Aurania, which aggregated 5,003 tons, and which was loaded at Toledo recently for Sheboygan. A corrected cargo record follows:

Iron Ore—Coralia, Mutual Transportation Co. of Cleveland, 5,088 gross or 5,699 net tons, Gladstone to Ashtabula, draft of 16 feet 10 inches. From Lake Superior—Steamer Sir William Siemens, Bessemer Steamship Co. of Cleveland, 4,810 gross or 5,387 net tons, Duluth to Fairport, draft of 16 feet 1 inch.

Grain—Steamer Queen City, A. B. Wolvin of Duluth, 207,000 bushels of corn, equal to 5,796 net tons, Chicago to Buffalo, 16 feet 8 inches draft. From Lake Superior—Steamer Andrew Carnegie, Wilson Transit Co. of Cleveland, 182,760 bushels of wheat, equal to 5,482 net tons, Duluth to Buffalo, on draft of 16 feet 1 inch; steamer Crescent City, A. B. Wolvin of Duluth, 318,000 bushels of oats, equal to 5,088 net tons, Duluth to Buffalo.

Coal—Schooner Aurania, John Corrigan of Cleveland, 5,003 net tons bituminous, Toledo to Sheboygan; steamer Andrew Carnegie, Wilson Transit Co. of Cleveland, 4,997 net tons of bituminous, Cleveland to Sheboygan, draft of 15 feet 2 inches.

Speed—Owego, Union Line of Buffalo, Buffalo to Chicago, 889 miles, 54 hours and 16 minutes, 16.4 miles an hour; Centurion, Hopkins Steamship Co. of St. Clair, Mich. Buffalo to Duluth, 997 miles, 65 hours and 10 minutes, 15.3 miles an hour.

Miscellaneous Matters.

Tuesday, June 1, is the date fixed for the sale of the old revenue cutter Johnson at the ship yard of the Globe Iron Works Co., Cleveland. Particulars of the vessel and conditions governing the sale will be found elsewhere in this issue.

Tonnage of new lake tow barges, as computed by the treasury department: W. Le Baron Jenney, 3,422.64 gross and 3,280.02 net; Athens, 2,073.88 gross and 1,953.68 net; Crete, 2,040.76 gross and 1,920.56 net.

While on a visit to the Mesabi range recently, Mr. F. T. Gates, who has charge of all of Mr. Rockefeller's operations in the Lake Superior mining region and on the lakes, was accompanied by E. M. Harper, president of the Chicago University.

The Cleveland-Cliffs Iron Co. has employed dredges to deepen the channel in front of the Pioneer furnace dock at Gladstone and there is now between 17 and 18 feet of water up to the dock. The bar that was present last fall has been dredged out.

The gunboat Nashville, which earned a very handsome premium on Friday last for her builders, the Newport News Ship Building & Dry Dock Co., has a complete equipment of Blake steam pumps, the same as the gunboats Helena and Wilmington, which were also built by the Newport News company. These vessels are also supplied with Wheeler surface condensers for the auxiliary machinery.

A smooth roadway. Perfect passenger service. Uniformed colored train porters for the convenience of both first and second class coach passengers. Quick time. Through sleeping car service between Chicago, Cleveland, Buffalo, New York, and Boston. A superb dining car service. No change of cars for any class of passengers between Chicago and New York City. Rates lower than via other lines. These are advantages presented by the Nickel Plate road. 47 June 10

Now that the Lake Ontario grain movement will be increasing, masters will want Lake Ontario general chart No. 61 and coast chart No. 1, as well as St. Lawrence river charts Nos. 4, 5 and 6. The five will be sent by the Review to any address by express for \$2.

Expense of Improving Fire-Room Forces:

Editor Marine Review:—It is announced that in the operation of the Northern line passenger steamers North West and North Land during the coming summer special attention will be given to the fire-room force, in order to avoid the trouble that has been encountered with the Belleville water tube boilers ever since these vessels were placed in commission. The force of firemen, or boiler attendants in whatever capacity they are engaged, are to be educated, we are told, up to a degree of efficiency equal to that attained on the big cruisers which the British admiralty has equipped with boilers of this kind. If it is necessary to bring about such a reform in firemen in order to successfully operate boilers of Belleville type, it would seem that we are still very far away from general use of them in ordinary merchant ships. This question of fire-room detail, necessitating skilled men and other attending expense, is evidently the great barrier to the general adoption of this type of boiler in the mercantile marine, notwithstanding the extent to which it is now being used in naval vessels, especially in England. In an address before one of the engineering societies in London, recently, the engineer-in-chief of the British navy said that "experience with these boilers had previously shown that to secure efficient results the fires should be stoked at regular intervals, and kept light, in view of the fact that practically only the funnel draught was available." And then he goes on to explain that "for this purpose clocks were fixed in the stokeholds, and the two furnace doors in each boiler were fired alternately at intervals of about four or five minutes; thus the fire was replenished every eight or nine minutes. Sight holes are provided in the smoke-box casings through which the fires can be observed. Air gauges can be inserted in these sight holes to ascertain the pressure of the gases over the fires."

It would certainly seem that the matter of great care necessary to the operation of these boilers is the weak point in the system. To expect the ordinary fireman to do all that is necessary "to secure efficient results" is absurd. Probably on the big lake passenger steamers this summer the management of the engine-room forces as a whole will afford the kind of service with the ships that was contemplated when they were built. It is to be hoped that such will be the case, as the enterprise of the Northern Steamship Co. in connection with passenger service on the lakes has been worthy of commendation from the beginning. But the fact remains that in the mercantile marine, except perhaps here and there in rare cases of special service that will warrant extra expense, boilers of this type are not desirable.

Buffalo, N. Y., May 17, 1896.

Marine Engineer.

D. E. Ford, who is to take up the duties of superintendent of the ship yard of the American Steel Barge Co. at West Superior about June 1, was engaged on tugs in the Chicago river only a few years ago. He found favor with Mr. Viet of New York, who looks after the vessel interests of the Standard Oil Co., and his progress with that company has been rapid. It is understood, however, that in his new position he will represent eastern capitalists associated with Colgate Hoyt, more so than the interest of Mr. Rockefeller in the barge company. While the Rockefeller fleet of new vessels were building on the lakes in 1895-96, Mr. Ford was engaged as a representative of the owners at the Globe yard, Cleveland, and at the works of F. W. Wheeler & Co., West Bay City. Of late he has been supervising the construction of the big oil barge that is being built for the Standard company at Buffalo.

The Brown Hoisting & Conveying Machine Co. of Cleveland has received an order for an electric traveling crane of 25 tons capacity and 58 feet span from the Chicago Ship Building Co. Electric power is to be used entirely in the shops which the Ship Owners' Dry Dock Co. of Cleveland is equipping for repairs to steel vessels. The buildings for this work at the Ship Owner's plant are up and machinery is being installed as rapidly as possible. The tools will include rolls, punches and sheers, all directly connected to electric motors. The rolls are said to be the largest on the lakes. It is now thought that the cost of this repair plant may reach \$20,000.

C. W. Whitney of New York, sole agent in the United States and Canada for Purves' furnace flues and Serve's boiler and stay tubes, has removed from 68 to 11 Broadway in the Bowling Green building. A number of prominent people connected with marine affairs have taken offices in this building, and Mr. Whitney will find himself in good company.—Marine Journal.

Immense Iron Furnaces.

Within the next month the Carnegie Steel Co. will have completed its big Duquesne furnace plant, which is the largest and most modern works of its kind in the world. Furnace No. 3 at Duquesne was put in blast May 7. The final work is being done on No. 4, which will be ready for firing early in June. Two of the modern furnaces, Nos. 1 and 2, have been in operation for several months. Besides the four new furnaces at Duquesne, the Carnegie company has two old stacks, and foundations have been laid with the ultimate intention of replacing these old stacks with others of the same design as Nos. 1, 2, 3 and 4. After No. 4 furnace at Duquesne is fired next month, the Carnegie company's seven stacks at Bessemer will be remodeled, so that they will have the same capacity as the Duquesne stacks, which average over 500 tons a day each.

It is with this plant, in connection with his ore possessions on the Mesabi range, his steamship contract with John D. Rockefeller and his railway from Conneaut to Pittsburg, that Andrew Carnegie expects to maintain beyond attack his supremacy in the iron industry. Stretching along the whole length of furnaces at the Duquesne plant is a monster stock yard for ore. It has a total length of 1,100 feet and a width of 300 feet, and is surrounded by a solid masonry wall 32 feet high. Its effective width is 226 feet, and it has a total capacity of 600,000 tons of ore. In the construction of this stock yard, 265,000 cubic yards of earth were excavated at a cost of about \$80,000, and 25,000 cubic yards of stone were placed in the great wall. The floor of the yard was made 3 feet deep with concrete, requiring about 155,000 barrels of cement. The yard is drained by a large sewer, and at one corner provision is made against a flood by a well or pump. The stock yard is spanned by three great electric cranes and along its whole length on the furnace side, erected from the yard level, are two series of steel constructed bins, one set for ore and the other for coke and limestone. There are thirty-six ore bins in a line farthest from the furnaces, with chutes running to either side. One is for the delivery side and that nearest the furnace is known as the consumption side. A track runs over the center of the bins, and the ore is dropped from the steel hopper cars into the bins. If the ore is to be stocked it is dropped into the delivery side and is caught and carried automatically by a conveyor to large piles in the stock yard. If for immediate use it is dropped into the consumption side. When ore is needed from the stock yard piles it is simply scooped up by the five-ton buckets and carried by conveyors to the consumption side. These great cranes, each with a capacity for handling 2,000 tons of ore daily, have a clear span of 223 feet. Each is capable of moving 100 feet a minute on its own tracks. The inner series of bins is provided for coke, limestone, mill cinder and some grades of ore. The total storage capacity of the bin system is 9,500 tons of ore, 3,600 tons of coal and 2,200 tons of limestone. The material is drawn from the bins into buckets for feeding the furnace. These buckets rest on cars, provided with scales for weighing the ore. A train of these cars is pushed to the foot of the furnace hoist, where each bucket is picked off, hauled up and dumped into the furnace. The hoists are controlled by an engineer in the hoist house, and the position of each bucket is known there. Not a single man is on the furnace top, and the charging is all in the control of the engineer. The whole time in picking up and returning a bucket is one and three-quarter minutes, the ore buckets holding 10,000 pounds, and the coke 4,000 pounds. A hot blast pipe is run to each ore bin, to keep the ore from freezing during the winter.

The large single-sheet chart of Georgian bay, just issued by the British admiralty, was prepared from the surveys on which Staff Commander J. G. Boulton, R. N., has been engaged for several years past. This chart may be had from the Marine Review for \$1.75. The price is higher than is usually charged for navigators' charts, but this one takes the place of probably ten sectional charts and is corrected up to date.

Dimensions of the Cleveland Ship Building Co's new dry dock at Lorain will be: Length over all, 560 feet; width on top, 102 feet; width at bottom, 56 feet; gate, 66 feet; water over mitre sill, 17 feet. Pumping facilities will admit of the dock being emptied in an hour and fifteen minutes.

Appointments of captains and engineers for 1897, vest pocket size, \$1.00. Order from the Marine Review, Cleveland, Ohio.



DEVOTED TO LAKE MARINE AND KINDRED INTERESTS.

Published every Thursday at No. 409 Perry-Payne building, Cleveland, Ohio,
by John M. Mulrooney and F. M. Barton.

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binders sent, post paid, \$1.00. Advertising rates on application.

Entered at Cleveland Post Office as Second class Mail Matter.

The books of the United States treasury department on June 30, 1896, contained the names of 3,333 vessels, of 1,324,067.58 gross tons register in the lake trade. The number of steam vessels of 1,000 gross tons, and over that amount, on the lakes on June 30, 1896, was 383 and their aggregate gross tonnage 711,034.28; the number of vessels of this class owned in all other parts of the country on the same date was 315 and their tonnage 685,204.55, so that more than half of the best steamships in all the United States are owned on the lakes. The classification of the entire lake fleet on June 30, 1896, was as follows:

	Number.	Gross Tonnage.
Steam vessels.....	1,792	924,630.51
Sailing vessels and barges.....	1,125	354,327.60
Canal boats.....	416	45,109.47
Total.....	3,333	1,324,067.58

The gross registered tonnage of the vessels built on the lakes during the past six years, according to the reports of the United States commissioner of navigation, is as follows:

Year ending June 30, 1891.....	204	111,856.45
" " " 1892.....	169	45,968.98
" " " 1893.....	175	99,271.24
" " " 1894.....	106	41,984.61
" " " 1895.....	93	36,352.70
" " " 1896.....	117	108,782.38
Total.....	864	444,216.36

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC. (From Official Reports of Canal Officers.)

	St. Mary's Falls Canal.			Suez Canal.		
	1895*	1894	1893	1895	1894	1893
No. vessel passages.....	17,956	14,491	11,008	3,434	3,352	3,341
Tonnage, net registered.....	16,806,781	13,110,366	9,849,754	8,448,383	8,039,175	7,659,068
Days of navigation.....	231	234	219	365	365	365

* 1895 figures include traffic of Canadian canal at Sault Ste. Marie, which was about 1/4 per cent. of the whole, but largely in American vessels.

Heavy battleships with still heavier guns and armor cause great strains in dry docks, but the faults developed by these big ships of late in the Brooklyn navy yard dock and in government docks elsewhere will not serve as an argument against the construction of timber dry docks. There are ten or twelve timber docks on the lakes, ranging in length from 300 to 500 feet, and there are half a dozen more at Philadelphia, Newport News and other points on the Atlantic coast, all of which were successfully built and placed in operation immediately upon their completion. It may be said, of course, that the lake docks are seldom subjected to even the strain of a loaded vessel, but they are found capable, nevertheless, of withstanding the strains for which they are built, and the same may be said of successful wooden docks in private ship yards on the coast. Defective construction seems to be the difficulty with these naval dry docks, as with many other government works. "There are all sorts of explanations of the tremendous leakage of water into the Brooklyn dock," says the Army and Naval Journal, "but none of them seem to be quite satisfactory. It cannot be true that the water which is percolating through the surrounding soil to the amount of hundreds of gallons a minute, comes through a gap in the sea wall. When the facts are finally arrived at, it will be found that the real fault is in the abutments, which have not been properly constructed. To provide a sufficient remedy it will be necessary to put down new sheet piling to a sufficient depth and to build a coffer-dam around the abutments, all of which will cost probably not less than \$25,000. The fault developed in this dock will probably revive criticism of the whole system of timber dry dock building, but not rightly so. The Mare Island (Cal.) dry dock, which is concrete laid upon piling, required sixteen years to complete, and cost about \$3,000,000, and is only 500 feet long. This is about five times the cost of a serviceable timber dry dock greater in its dimensions. Timber dry docks have justified the theories upon which they are constructed by their performances. The one at Erie basin has been in constant use since 1864 and there are numerous other satisfactory docks in different parts of the country built on the same principle."

Engineering journals from England contain lengthy accounts of trials of the torpedo boat Turbinia, and all of them give up columns of space to discussing her machinery. They are all inclined to the opinion that the torpedo boat of the future will be propelled on the turbine principle. The inventor has been approached by several well known companies, who are desirous of taking over the patents, but it is prob-

able that an independent company will be formed with sufficient capital to experiment further with a view to applying machinery of this kind to ordinary merchant vessels. As the demand for higher speed in the torpedo boat chasers increases, the builders are meeting with new difficulties in fulfilling their contracts with the government. The 30-knot destroyers are evidently proving troublesome, as several of the contractors have had repeated trials without attaining the required speed. Even some of the firms that have been entrusted with the building of the 27-knotters have been unable to fulfill the conditions as yet, so that altogether, notwithstanding the fact that the prices paid for these flyers were considered high, the contractors are in most cases likely to find their anticipated profits dwindling away, owing to the difficulties to be overcome.

The United States navy is not alone in the work of conducting experiments with nickel steel for marine boilers. Experiments with plates of this alloy are now being made quite extensively in England. The limit of steam pressure in cylindrical boilers is practically fixed by the thickness of shell required for them, and as nickel steel possesses a much higher tenacity than ordinary boiler steel, it is hoped that the former may be able to replace the latter in a satisfactory manner. If a good trustworthy nickel steel up to fifty-four tons per square inch can be secured, as compared with the twenty-seven to twenty-eight tons of mild boiler steel, it is quite evident that manufacturers can go on still further increasing steam pressures in cylindrical boilers without increase of thickness to the shell. This would be a great boon to the mercantile marine, which so far shows no great love for the water tube boiler, but a strong attachment to the long-tried Scotch type.

A complete report of the official trial of the revenue cutter Gresham, which will leave the ship yard of the Globe Iron Works Co., Cleveland, in a few days, for regular service on the St. Mary's river, is contained in the May number of the Journal of the American Society of Naval Engineers. The report was prepared by First Assistant Engineer C. A. McAllister of the revenue cutter service and goes into all details of the vessel and results of the trial. As the Gresham attained a speed of practically twenty statute miles an hour on this trial, she may be classed among the few very fast vessels on the lakes. There are probably not more than three others in her class.

In a communication elsewhere in this issue, Col. G. J. Lydecker of Detroit asks vessel masters to exercise special care in the navigation of the new Grosse point cut. Gen. Alger of the war department had considered the question of promulgating rules for the navigation of this channel. He decided, however, that vessel owners and vessel masters were equally interested with the government in the care of this new waterway and concluded that a cautionary notice would be sufficient. It is to be hoped that it will be found that this confidence in the vessel masters has not been misplaced.

Twenty-four naval vessels of different types, now under construction in several ship yards throughout the United States, will be completed before Nov. 1. The list includes one battleship (Iowa), eight gunboats, thirteen torpedo boats, one sub-marine torpedo boat and a tug. Five battleships—Kearsarge, Kentucky, Illinois, Alabama and Wisconsin—are also under contract to be completed in 1899.

Advices from the northwest are to the effect that country grain elevators have recently sold 2,700,000 bushels of cash wheat, the same to go out by way of Duluth during the last of May and the first of June. These shipments have probably helped to cause the slight improvement that has been noted within the past few days in Duluth grain freights.

Col. John W. Barlow and Col. Henry M. Robert of the United States engineer corps have changed places as division engineers. Col. Barlow takes charge of the northwest division with headquarters at Green Bay, Wis., and will be succeeded by Col. Roberts in charge of the southwest division.

Why not patronize the Nickel Plate road on your next trip to New York City or Boston. They operate solid through trains, elegantly equipped with palace sleepers, and fine day coaches attended by uniformed colored porters, whose duties require them to look out for the comfort of passengers. Magnificent dining cars. The popular low rate short line.

River Tugs of the Sixties.

How the famous old Detroit river tugs did make money during and for eight years succeeding the close of the war. Figures on the earnings of the Detroit & River St. Clair Towing Association for the year 1866, compiled from old ledgers, are proof conclusive of this. This association was really a pool made in the spring of each year, the papers for which were usually drawn up by Henry B. Brown, now United States supreme court justice, William A. Moore and the late John S. Newberry. In that particular year thirty-three tugs were in the agreement. Some were big money-makers; others did not amount to a pinch of snuff. The net earnings were divided at the end of the season, based entirely on the earning capacity of the respective tugs. It mattered not that some earned little or nothing—their owners were reimbursed to an extent sufficient to satisfy them. The object of this pool was the maintenance of towing rates at a figure which in those days was considered fair. Cut-throat competition for towing was thus avoided. As in those times the bulk of the lake commerce was handled in schooners, there was work enough for all in that line alone. These were the tugs and their net profits that year: Satellite, \$23,322; Kate Moffat, \$23,159; Prindiville, \$17,909; Kate Williams, \$16,314; I. U. Masters, \$15,331; Bob Anderson, \$15,662; B. B. Jones, \$16,494; Hector, \$14,763; McClellan, \$13,512; Winslow, \$12,539; Mayflower, \$12,393; W. K. Muir, \$11,478; W. B. Castle, \$10,043; John Martin, \$10,818; George H. Parker, \$9,910; George N. Brady, \$9,579; E. M. Peck, \$9,256; Constitution, \$8,961; Anna Dobbins, \$8,211; Tawas, \$9,889; L. L. Lyon, \$9,887; Zouave, \$7,942; Park, \$9,902; Michigan, \$6,235; Samson, \$6,358; Red Eric, \$4,206; T. D. Dole, \$3,051; Dispatch, \$2,093; Eclipse, \$2,519; Stranger, \$1,771; S. S. Rummage, \$1,481; Dart, \$240. The Eagle lost \$95 on the season, but was given something out of the association to keep her quiet.

Imagine the Satellite and Kate Moffat earning much more than half their value in a single season. This of wooden steamers that were pigmies by the side of the mammoth steel freighters afloat to-day, yet making money that would cause the owner of a modern freighter to jump out of his seat if he had before him a prospect of clearing as much. The Satellite in those days was commanded by Capt. H. Ames, now living in well-earned retirement on Harsen's island. He could get more out of a tug and her crew than anyone around these parts. He was personally popular, and this perhaps had something to do with his effectiveness; but he was also willing to work night and day and had a keen scent for a schooner. Besides this, he was a first-class tug man, handled his tug and tows with a minimum of accident, and in every way acquitted himself creditably. Second only to him was Capt. Leon Holt, who was originally from the Cape Vincent region. He brought out the tug Champion, still in existence, and the most powerful tug that ever towed on the Detroit river. Thousands have seen the picture scattered around the lakes representing the Champion towing a long string of schooners down the river just below Windmill point light. But long tows were common with her. She once towed twelve schooners up the river, through the Fort Gratiot rapids and out into Lake Huron, where they cast loose and set sail for their destinations. For that tow she got about, \$700. The achievement has never been equaled by another steamer.

The ends of most of the tugs in the foregoing list were sad ones. The Masters burned while lying at her dock at Malden; the Satellite—the queen—foundered on Lake Superior. Something broke loose around her stern and she slowly began to settle. She had five schooners in tow. All cast loose and hoisted their flags to half-mast. Her own master ordered her colors set. Then she plunged to the great deep bottom, and more than one man wiped his eyes as the favorite disappeared forever. The Stranger burned at Trenton. The Kate Moffat burned at some Canadian port on Lake Huron. The Frank Moffat, not in the agreement at that time, but in it subsequently, exploded her boiler while lying at her dock at Sombra, and went to pieces, taking several lives with her. The Prindiville still lives. The W. B. Castle, L. L. Lyon and Bob Anderson are in the Inman fleet at Duluth. The Lyon, half-submerged in a slip below the Springwells dry dock, Detroit river, was a familiar sight for many years, and few thought she would ever again be put afloat. The Anderson kept her company in that grave yard for a long time. The Muir exploded her boiler in the St. Clair river, killing her master and mate. The McClellan was dismantled and now lies somewhere in the vicinity of the Springwells dry dock, her ribs just sticking out of the water. Up in Georgian bay the John Martin's stern dropped off one day and she

deliberately went to the bottom. The crew never stopped to protest, but took to the yawl. She's there yet. On a Lake Huron beach the bones of the Brady are whitening. The T. D. Dole burned. The Anna Dobbins was lost on Lake Huron. On the bottom of Lake Erie the bones of the Hector are being preserved, for it is said water does not rot timbers—while they stay in it. Down the Detroit river, all afire, drifted the Red Eric one day; she never came back. The St. Clair river was a favorite locality for tugs that no longer had use for their boilers; the B. B. Jones parted with hers up there, and thus she ended. On the beach of Point au Pelee rest the remains of the Mayflower. The E. M. Peck and Dart were dismantled, the Parker is towing logs for Boutell of Bay City; the Tawas' boiler went into the air on Lake Huron, and the Kate Williams has been laid up in Detroit several years.

Memory is a little indistinct as to the fate of the others. It is supposed they were squeezed against the dock—that the hulls went to the bottom and the pieces floated down the river. One of the oldest of the old ones was the Dart. She was literally a floating coffin, held together by half a dozen or more hog-posts. They called her the "hay-scales." The Michigan is haloed in history. She was originally the Canadian revenue steamer Prince Albert. In 1865 or thereabouts the atmosphere around Detroit was thick with Fenianism. The report once got out that a schooner was coming down from Chicago with 1,500 Fenians, who were going to raid into Canada at Windsor or some other point. The Prindiville came down the river one day with three schooners in tow, the middle one of which flew the Fenian flag. The Prindiville herself carried those colors and a brass cannon besides, which she let off with blank cartridges every now and then. It was just like Capt. Joe Nicholson, her master. On the middle schooner was a crew of nine men. The master dressed them up to represent nondescript soldiers, such as the Fenians were supposed to be. From the bow these men would start, marching aft the whole length of the vessel. There they would drop down and crawl on their hands and knees to the bow and begin their march over again. This they repeated over and over when opposite a port. All along the docks at Port Huron, St. Clair, Marine City, at the Canadian ports and at Detroit and Windsor thousands gathered to watch the strange spectacle. At first it was treated seriously, but finally the fact was made apparent that a huge practical joke was in progress. The Prince Alfred steamed up to the tow, but was given the merry laugh, and Capt. Joe fired his cannon and tooted his whistle and danced about in great glee. The panic of 1873 put a stop to the big earnings. For eight years succeeding it the tugs did little or nothing. Business picked up somewhat afterward, but the schooners were being supplanted by steamers, and those remaining were cut down into consorts. They are scarce these days, and the few tugs that remain have a precarious existence towing rafts and wrecking.—Detroit Free Press.

Stocks of Grain at Lake Ports.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store in regular elevators at the principal points of accumulation on the lakes, May 15, 1897:

	Wheat, bushels.	Corn, bushels.
Chicago	7,038,000	6,077,000
Duluth	4,494,000	23,000
Milwaukee	185,000	3,000
Detroit	104,000	2,000
Toledo	952,000	251,000
Buffalo	611,000	204,000
	13,384,000	6,560,000

As compared with a week ago, the above figures show, at the several points named, a decrease of 1,223,000 bushels of wheat and 1,010,000 bushels of corn.

A vest pocket pamphlet, just issued by the Marine Review, contains appointments of captains and engineers for 172 fleets of vessels owned on the lakes. It is practically a complete list of vessels, owners, captains and engineers on the lakes, corrected to date and put in the most concise form that it is possible to arrange the several thousand names contained in such a collection. It is neatly bound and durable. Mailed to any address on receipt of \$1.

Several hundred photograph negatives of lake ships are held in stock by the Marine Review. Prints can be made on short order.

Lake Superior Iron Ores

COMPLETE AVERAGE CARGO ANALYSES OF IRON ORES FROM SHIPPING
MINES IN THE LAKE SUPERIOR REGION—SEASON OF 1896.

The following tables of cargo analyses of Lake Superior iron ores were prepared for the association of ore dealers, which has headquarters in Cleveland. They are actual average cargo analyses except when marked thus.* When so marked the analysis is that expected for 1897.

MARQUETTE RANGE.

ORE.	IRON.	SILICA.	PHOS.	MANG.	ALUMINA	LIME.	MAG- NESIA.	SULPH.	ORG. & VOL.	MOIST.
Angeline, Hard	66.19	---	.014	---	---	---	---	---	---	3.99
Angeline, Hematite	66.03	---	.042	---	---	---	---	---	---	8.69
Angeline, South	62.87	---	.128	---	---	---	---	---	---	11.02
Barnum	65.50	3.49	.075	.36	1.80	.32	.26	.026	---	.89
Beacon	46.00	29.75	.043	.07	2.50	1.00	.80	.030	---	.84
Bessemer, Old Mine Hem*	63.00	3.23	.065	.65	1.80	.42	.21	.011	---	9.75
Blue	63.40	5.20	.118	.25	1.96	.55	.72	.010	1.80	10.55
Buffalo	61.80	6.60	.127	.55	1.84	.86	1.16	.003	2.10	10.70
Buffalo, South	61.95	5.70	.115	.39	1.75	.92	.71	.005	1.70	10.90
Cambria	61.40	9.60	.046	.34	1.92	.74	.30	.012	1.65	10.10
Champion No. 1*	65.00	3.80	.048	.07	1.70	.75	.55	.005	---	.80
Cleveland Bessemer	67.23	2.75	.044	.11	.20	.25	.24	.017	---	.84
Cliffs Shaft	62.42	3.65	.113	.35	1.70	1.15	1.00	.020	2.20	1.06
Comrade	59.37	---	.105	---	---	---	---	---	---	---
East End Bessemer	61.06	7.48	.046	.33	2.09	.23	.30	.014	2.94	10.33
Essex	60.00	10.25	.110	.30	2.20	.53	.20	.020	---	.74
Foster	51.45	18.45	.142	.27	1.10	.18	.39	.020	5.18	3.63
Foster Silica	42.00	27.00	.122	3.86	1.36	.20	3.67	.002	6.56	3.00
Harvard, Hematite *	65.50	2.85	.050	.67	1.70	.47	.25	.018	---	10.00
Ishpeming	57.41	10.35	.072	.57	2.62	.38	.36	.030	3.50	9.89
Lake	60.85	5.67	.088	.60	2.10	.41	.32	.013	3.50	12.10
Lake Bessemer No. 1	65.44	---	.030	---	---	---	---	---	---	9.97
Lake Bessemer No. 2	64.01	5.50	.038	.24	1.40	.35	.21	.019	1.78	9.63
Lake Silica	48.27	25.40	.042	.43	1.69	.36	.47	.035	1.65	9.07
Lake Superior No. 1	65.00	3.40	.100	.23	2.10	.26	.24	.013	---	1.15
Lillie	61.75	5.60	.077	.39	1.92	.37	.08	.010	2.79	9.60
Marquette	43.50	34.09	.051	.26	.97	.17	.17	.021	1.97	6.12
Missabe Friend	39.54	---	.020	---	---	---	---	---	---	.92
Negaunee, Non-Bessemer	62.30	4.30	.115	.30	2.90	.92	.20	.025	---	10.67
Non-Bess., Old Mine Hem	62.00	5.00	.130	.45	2.75	.53	.21	.020	---	7.78
Norfolk	56.00	13.75	.050	.09	2.50	1.10	1.05	.030	---	1.12
Oxford	64.50	4.45	.075	.32	1.80	.25	.23	.020	---	1.14
Peninsula	59.00	9.20	.118	.31	1.92	.82	.41	.007	1.47	10.80
Platt	58.70	---	.038	---	---	---	---	---	---	8.78
Prince of Wales	61.55	6.10	.122	.36	1.72	1.40	.46	.012	2.20	10.40
Queen	62.40	6.80	.110	.22	1.40	.86	.72	.002	1.64	10.65
Regent	62.30	7.27	.048	.23	1.95	.33	.09	.008	1.27	10.50
Republic, Special*	67.38	---	.020	---	---	---	---	---	---	1.02
Republic, Specular	67.62	2.23	.034	Trace	.68	.30	.09	.018	.20	1.31
Republic, Kingston	64.73	5.28	.036	.09	1.30	.36	.76	.030	---	1.31
Salisbury	62.10	4.91	.113	.30	1.42	.36	.19	.017	3.76	12.12
Salisbury, Bessemer	63.04	5.80	.049	.21	1.83	.21	.40	.022	2.10	11.93
Salisbury, Silica	49.31	24.10	.054	.36	2.20	.35	.18	.016	2.30	11.10
Savoy	62.05	7.75	.078	.34	1.85	.27	.17	.025	---	1.82
Sawmill *	60.00	---	.060	---	---	---	---	---	---	.84
Sec. 16, No. 1 Bessemer *	65.39	3.13	.014	.23	1.65	.24	.17	.015	---	.99
Sec. 16, No. 2 Bessemer *	62.00	7.75	.032	.23	1.70	.17	.19	.015	---	2.14
Sec. 16, New Shaft *	64.50	5.43	.035	.27	1.49	.27	.18	.016	---	2.08
Sec. 21, Hematite	62.00	5.25	.130	.40	1.10	.22	.21	.021	---	9.48
Sheffield	62.08	---	.018	---	---	---	---	---	---	3.50
Tilden, Silica	45.40	33.10	.039	---	1.00	---	---	---	---	3.00
Volunteer	55.83	---	.063	---	---	---	---	---	---	---
Winthrop	61.25	6.88	.135	.71	1.34	.44	.38	.027	2.62	11.37

GOGEBIC RANGE.

ORE.	IRON.	SILICA.	PHOS.	MANG.	ALUMINA	LIME.	MAG- NESIA.	SULPH.	ORG. & VOL.	MOIST.
Anvil	62.74	4.09	.055	.82	.92	.47	.11	.018	2.25	12.36
Anvil, East Vein	61.00	5.25	.058	2.18	.86	.05	Trace	.014	---	12.75
Atlantic	62.27	4.59	.040	1.11	1.15	.18	.07	.023	3.13	10.48
Ashland	62.91	4.32	.036	.21	1.92	.12	.14	.021	---	10.70
Aurora	62.94	4.02	.029	.48	1.10	.37	.01	.022	---	9.68
Brotherton	62.60	7.05	.037	.46	1.10	.30	.10	.004	1.50	11.11
Cary Empire *	58.50	3.65	.055	4.55	1.25	.16	.10	.015	---	8.28
Colby	56.80	3.20	.071	5.75	.98	.24	.18	.010	2.10	9.30
Cromwell	60.00	3.75	.032	3.10	.75	.10	.13	.010	---	9.58
Eureka	61.65	6.75	.066	1.40	.95	.52	.22	.011	1.97	9.80
Iron Belt	62.54	5.05	.042	.54	1.65	.10	.02	.015	---	10.67
Lawrence	60.40	8.90	.057	.45	1.30	.09	.02	.023	---	9.72
Melrose	63.07	2.96	.029	1.08	.78	.10	.08	.016	---	9.11
Montreal	64.88	4.10	.042	.33	1.02	.10	.05	.025	---	8.57
Newport	55.70	3.30	.040	7.40	.98	.30	.07	.016	---	9.44
Norrie	63.18	3.62	.041	.34	1.74	.19	.13	.017	---	9.86
Pabst Ex. *	64.00	---	.035	---	---	---	---	---	---	9.19
Palms *	63.50	3.62	.045	.88	1.11	.16	.10	.013	3.50	11.58
Pearce	58.60	11.44	.062	.64	.81	.22	.13	.014	2.07	7.60
Rand	59.62	5.25	.033	3.21	1.07	.66	.60	.017	---	9.15
Shores	65.23	---	.029	---	---	---	---	---	---	7.50
Sunday Lake *	62.05	8.80	.022	.54	.77	.15	.06	.010	.54	13.20
Tilden	63.56	3.97	.043	.78	1.38	.22	.21	.009	---	12.46

MENOMINEE RANGE.

ORE.	IRON.	SILICA.	PHOS.	MANG.	ALUMINA	LIME.	MAG- NESIA.	SULPH.	ORG. & VOL.	MOIST.
Badger	59.20	4.83	.131	.42	2.76	1.10	2.89	.110	---	9.07
Chapin *	62.00	3.16	.066	.39	1.16	1.07	2.79	.013	2.52	6.72
Clifford	41.87	37.80	.011	.10	1.00	.35	.34	.012	---	2.14
Crystal Falls	58.55	4.25	.721	.29	1.16	2.64	.77	.008	2.92	7.20
Davidson	56.06	6.33	.170	.37	3.41	1.54	2.97	.101	---	8.40
Dunn	58.61	3.88	.573	.58	1.88	1.80	.83	.033	5.44	8.70
Elmwood	58.10	5.91	.172	.42	3.06	1.03	2.38	.096	---	9.05
Florence	57.60	4.67	.343	---	2.65	1.20	1.53	.214	5.54	7.59
Hemlock	60.20	4.71	.309	.39	2.81	1.87	1.32	.010	---	6.62
Homestead	54.87	4.68	.086	.38	2.05	3.48	4.87	.003	---	---
Keel Ridge	40.64	37.42	.046	.20	.90	1.35	1.00	.006	---	2.90
Loretto	60.50	8.82	.017	.29	1.92	.15	.47	.077	1.54	8.69
Ludington	65.60	---	.024	---	---	---	---	---	---	7.06
Mantodon	61.00	4.50	.350	.30	2.75	.50	.30	.075	---	9.00
Millie	62.10	---	.027	---	---	---	---	---	---	5.47
Pewabic	64.36	3.85	.009	.19	.48	1.10	1.35	.003	---	6.46
Pewabic Genoa	42.79	35.28	.007	.10	.96	.52	.95	---	---	4.32
Rex	57.68	5.65	.063	.81	1.21	1.48	4.39	.016	3.44	6.53
San Jose	65.41	3.23	.013	.24	1.24	.16	.25	.043	.78	7.60
Sheridan	58.50	6.50	.130	.50	4.00	.60	.70	.250	---	9.12
Star Ludington	63.50	2.50	.086	.40	1.09	.50	.40	.010	2.15	7.00
Toledo	53.55	18.23	.010	.18	.65	1.20	1.57	.003	---	6.28
Tyrone	62.00	3.91	.106	.19	.72	1.50	1.90	.003	---	---

MISSABE RANGE.

ORE.	IRON.	SILICA.	PHOS.	MANG.	ALUMINA	LIME.	MAG- NESIA.	SULPH.	ORG. & VOL.	MOIST.
Adams	64.18	2.80	.035	.40	.80	.21	.10	.007	3.80	7.29
Auburn	65.04	2.25	.047	.39	1.47	.68	.15	Trace.	.....	9.56
Audrey	62.69	2.64	.071	.66	1.52	.25	.14	Trace.	.....	12.07
Beaver	64.44	2.20	.081	.17	1.50	.20	.10	.012	3.42	10.61
Berringer	61.16	4.55	.065	.35	1.59	.11	.07	.012	.....	8.91
Biwabik	64.61	3.00	.033	.25	.50	.24	.15	.005	3.40	7.71
Burt	65.48	3.17	.034	.49	1.43	.56	.20	.006	.....	8.97
Canton	60.80	4.25	.048	.49	.93	.71	.07	Trace.	.....	9.97
Cincinnati	61.50	6.32	.037	.59	.98	.34	.15	.015	.....	8.00
Cincinnati Silica	59.00	8.00	.030	.60	1.00	.34	.15	.015	.....	8.00
Climax	63.64	1.94	.036	.87	.60	.88	Trace.	Trace.	.....	8.65
Cluquet	62.07	4.00	.033	.37	1.60	.28	.30	.....	.....	13.13
Commodore	63.60	4.10	.038	.12	.90	.37	.04	.011	3.40	10.25
Fayal	62.55	3.06	.037	1.00	1.30	.26	.14	Trace.	.....	9.55
Franklin	62.79	4.12	.036	.69	.81	.30	.26	.021	3.61	6.26
Genoa	62.70	3.75	.033	.65	1.16	.60	.19	None.	.....	11.29
Hale	60.00	5.00	.100	.55	.52	1.58	.....	.016	.....	9.00
Helmer	64.00	3.65	.051	.48	1.80	.15	.10	.015	.....	11.15
Hull	65.52	2.43	.024	.19	.79	.02	.14	.018	.....	10.79
Mahoning	64.28	2.75	.050	.33	1.50	.21	.14	.020	3.00	10.34
Mangan	59.80	5.50	.034	.68	1.52	.32	.10	.....	.....	13.55
Minnewas	65.63	2.35	.047	.35	1.14	.20	.03	.008	2.05	9.00
Norman	62.15	3.75	.069	.90	1.82	.52	.13	Trace.	.....	8.41
Ohio	61.53	.....	.082	.....	.....	.....	.....	.....	.....	6.95
Ohio Katonah	64.41	2.95	.053	.40	1.34	.37	.25	.006	2.42	8.35
Roberts	62.00	7.57	.030	.23	.66	.15	.12	.002	.....	7.00
Rust	65.00	2.50	.030	.25	1.25	.25	.15	.012	.....	9.25
Saxon	64.29	3.75	.039	.56	1.21	.12	.04	.....	.....	8.00
Sellers	64.23	3.66	.036	.38	.95	.19	.12	.019	2.66	8.73
Shenango	64.07	2.69	.060	.30	1.62	.20	.16	.020	3.11	10.53
Tubal	63.25	4.50	.065	.45	1.75	.20	.08	.013	.....	11.54
Valley	61.03	5.66	.041	.31	.....	.....	.....	.....	.....	12.76
Vega	61.99	5.40	.040	.26	1.45	.33	.18	11.57
Williams	60.40	9.20	.036	.77	.95	.42	.12	.011	3.60	9.70

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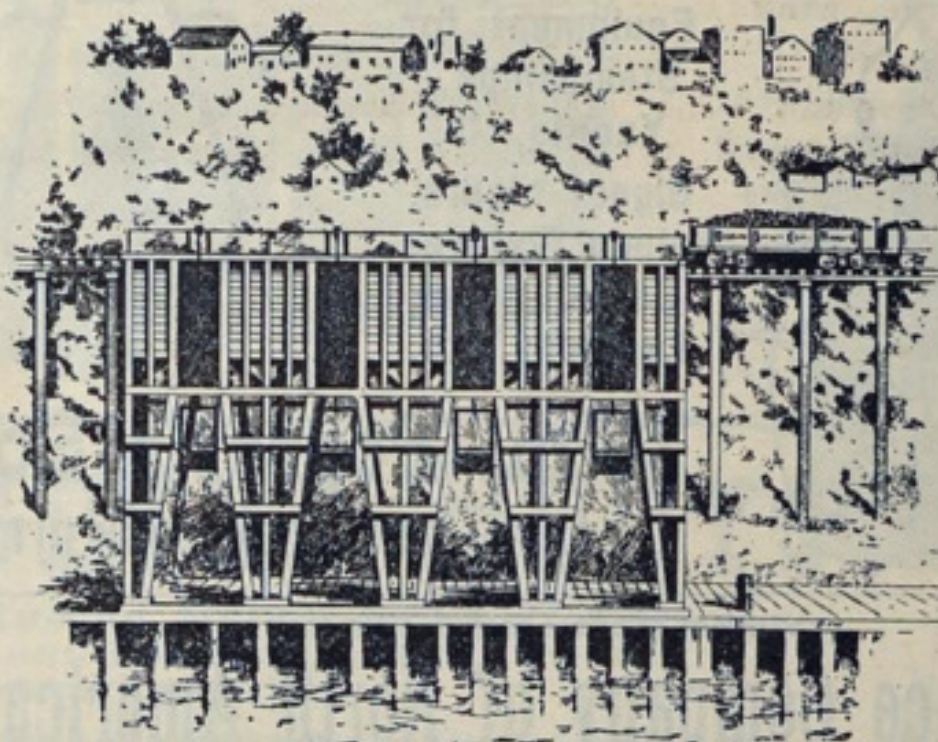
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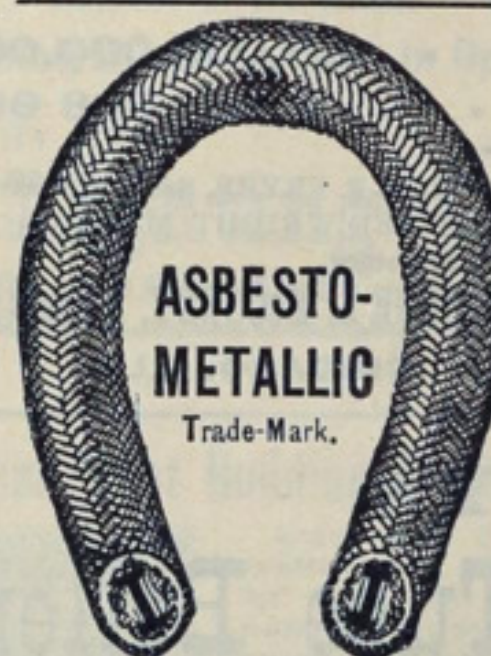
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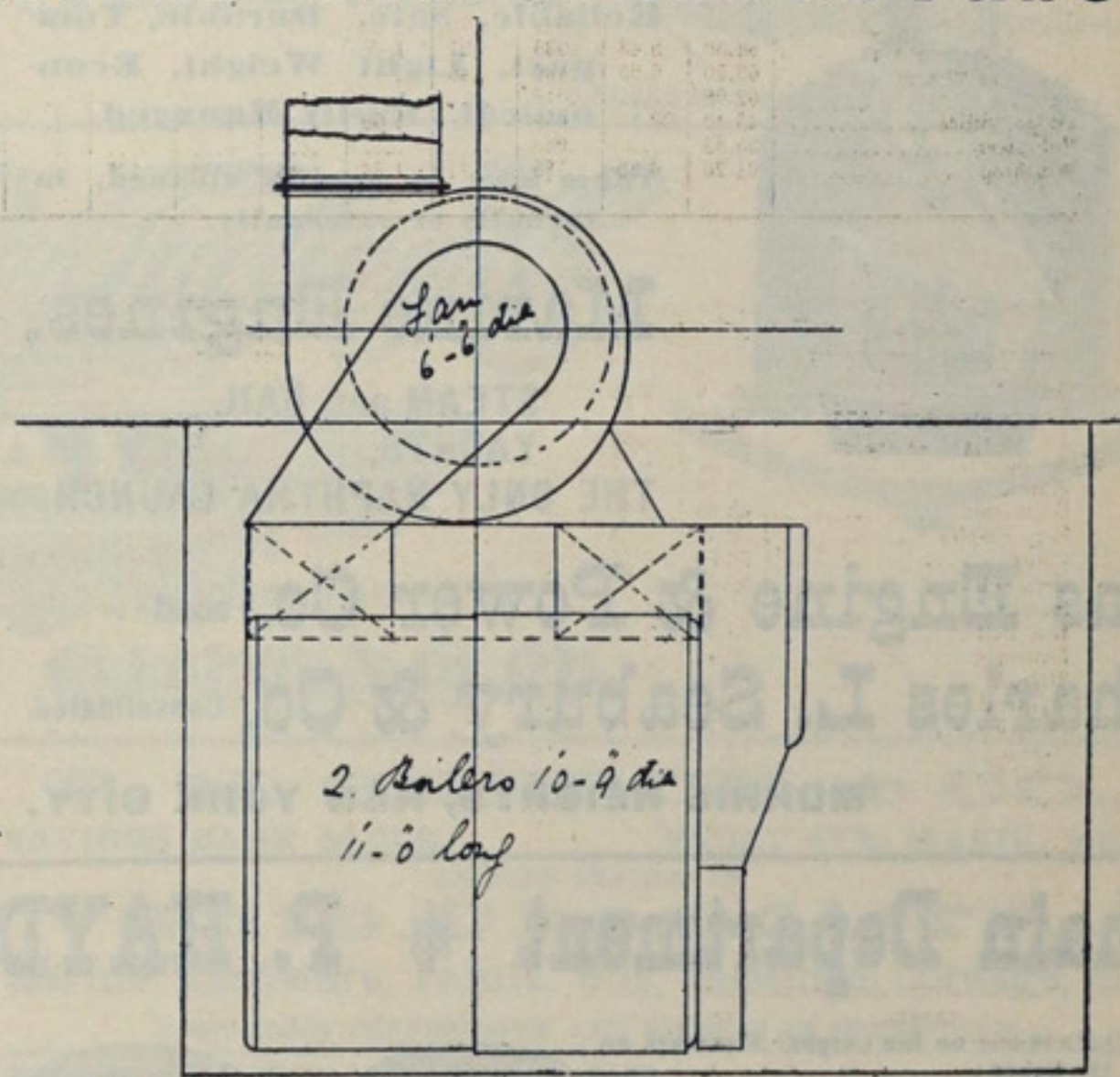
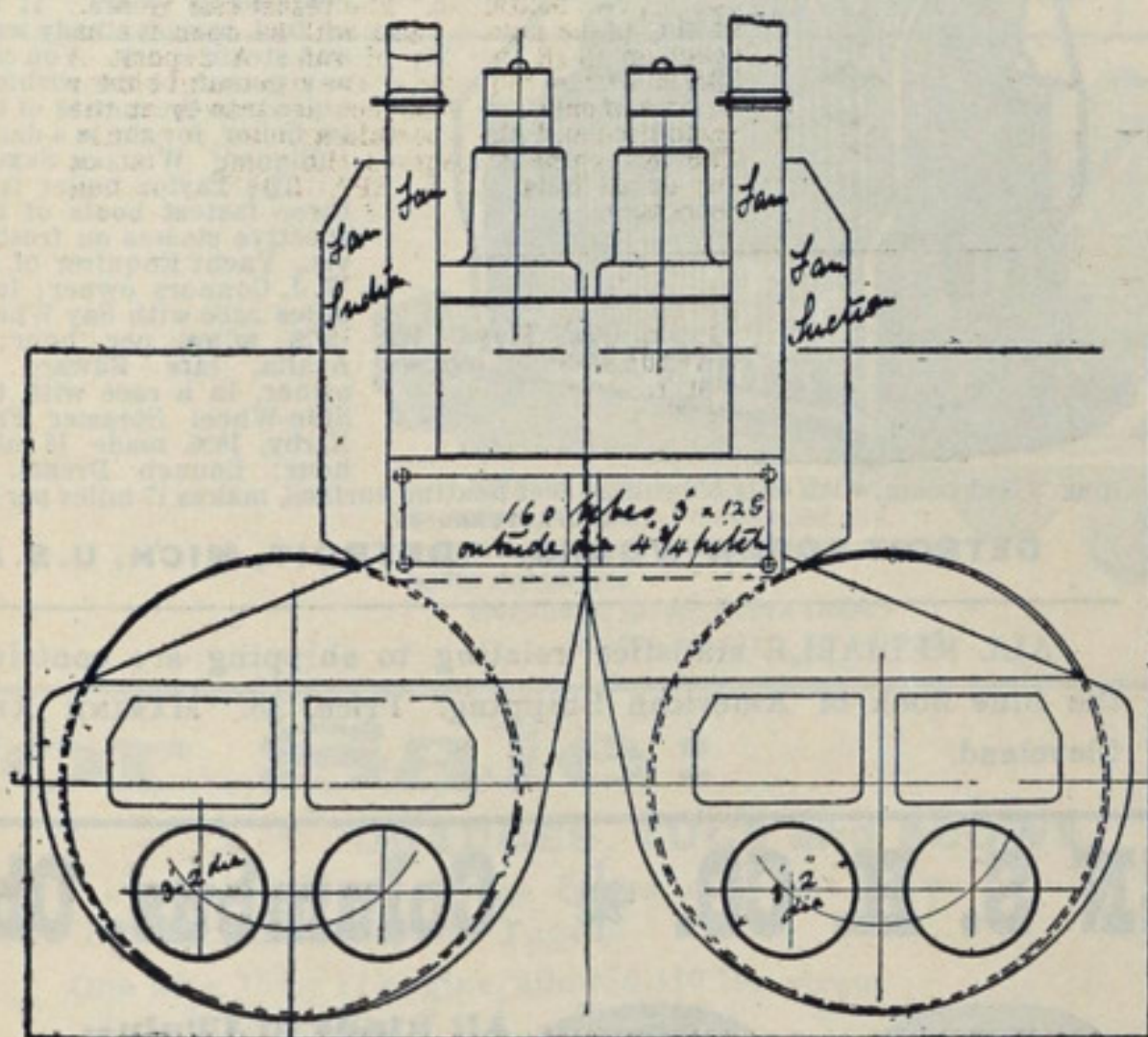
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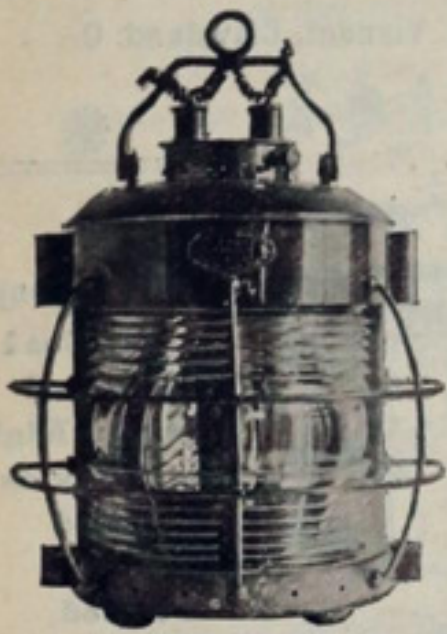
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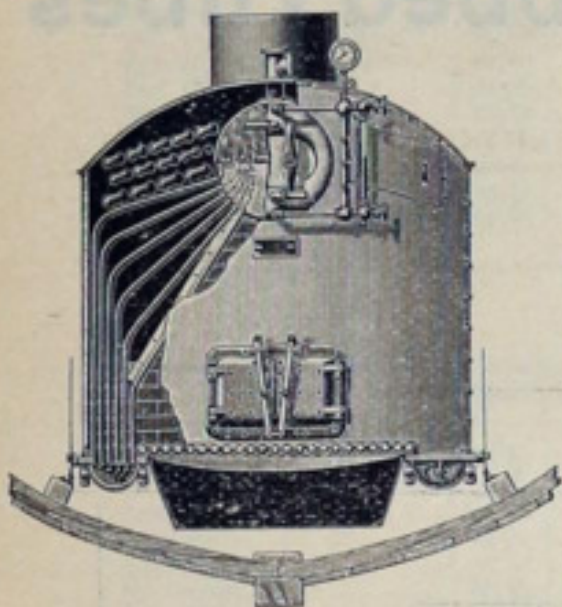
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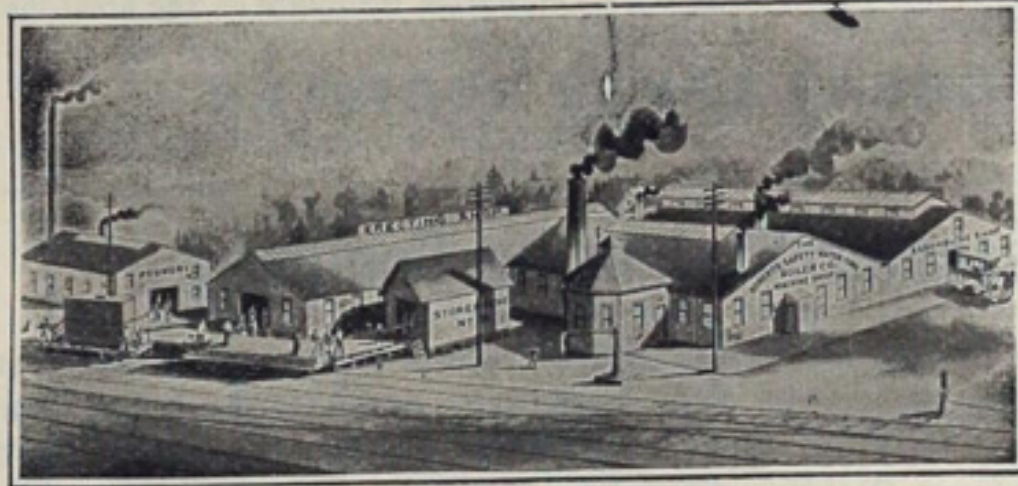
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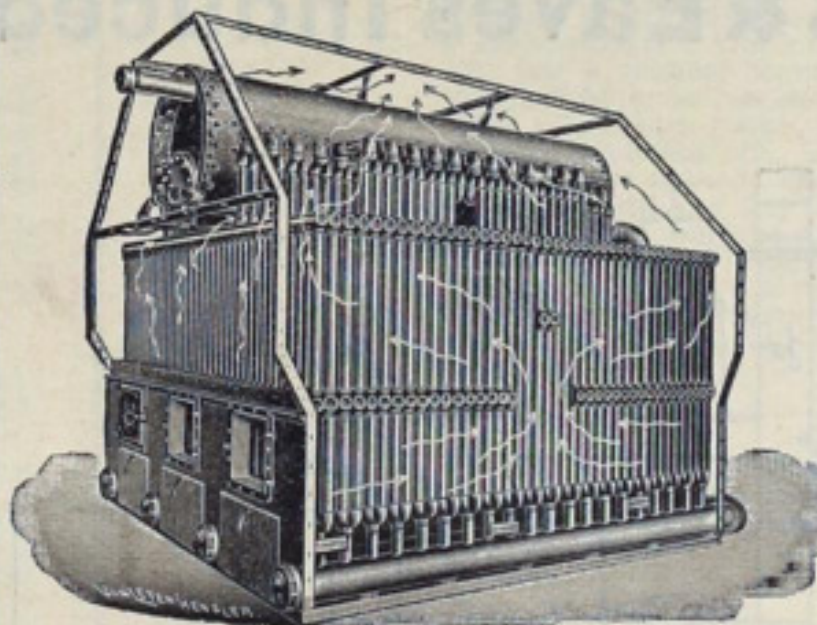
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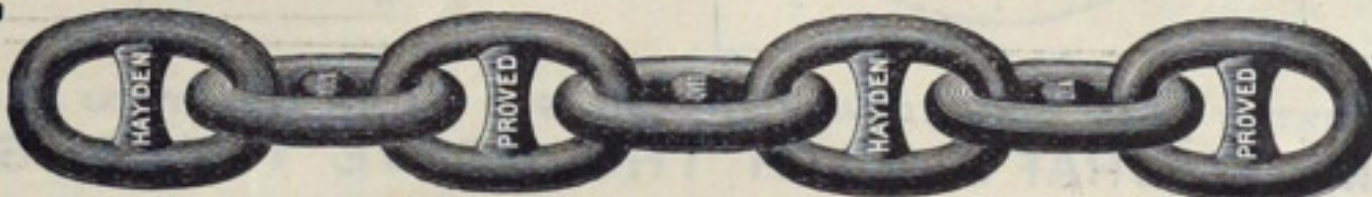
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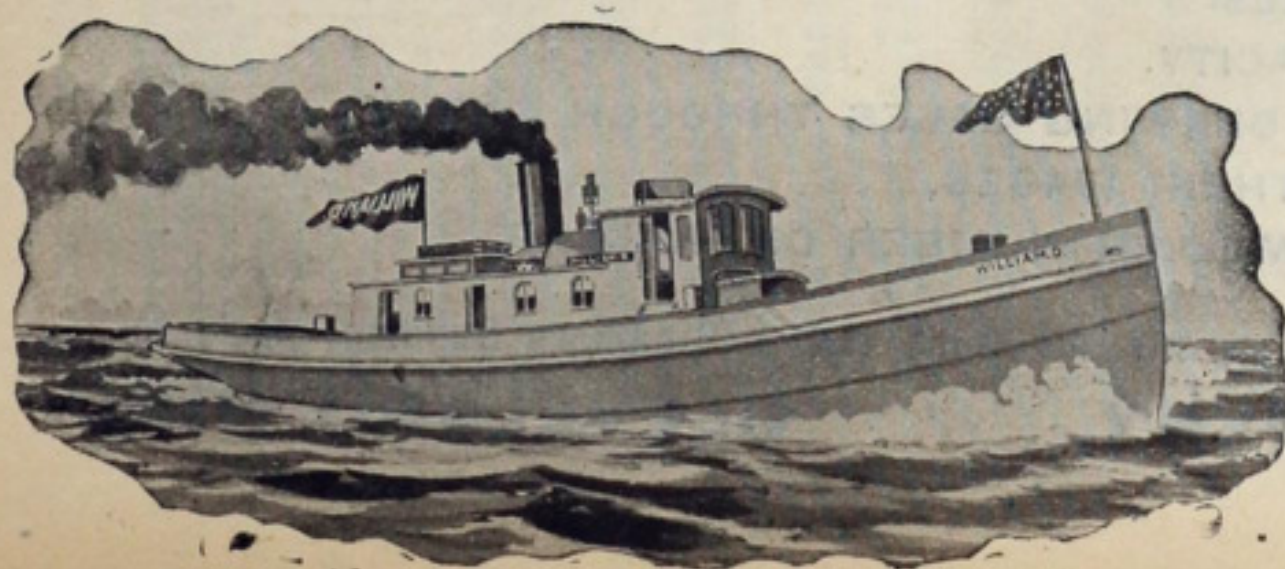
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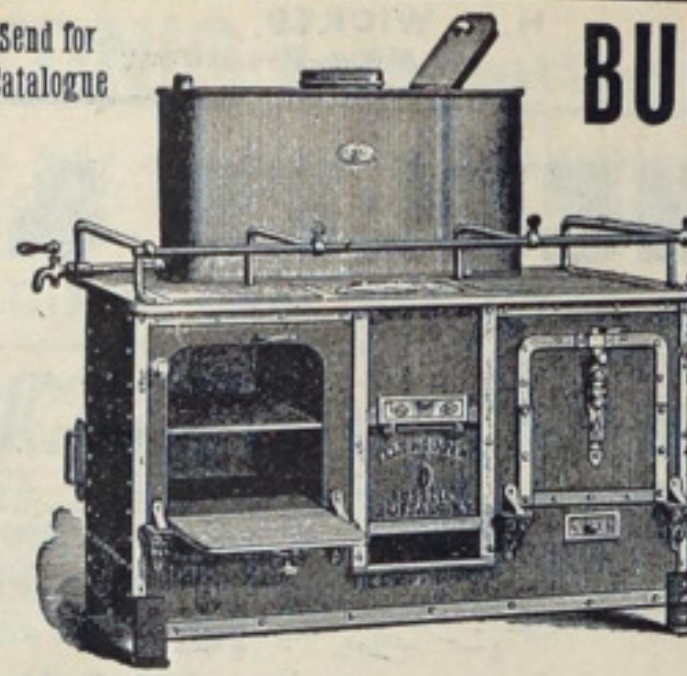
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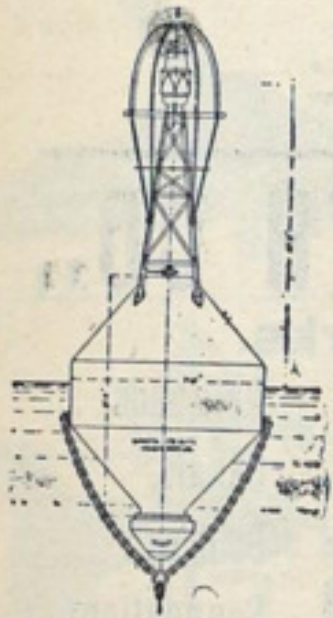
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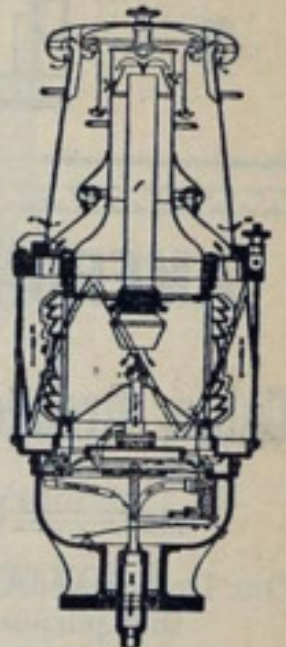
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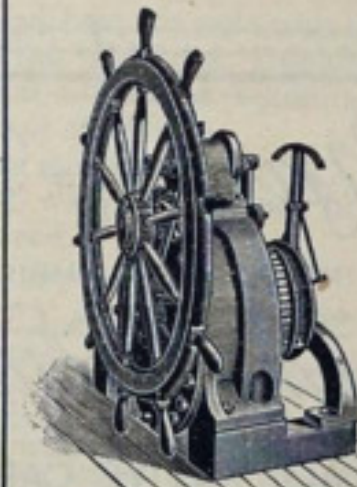


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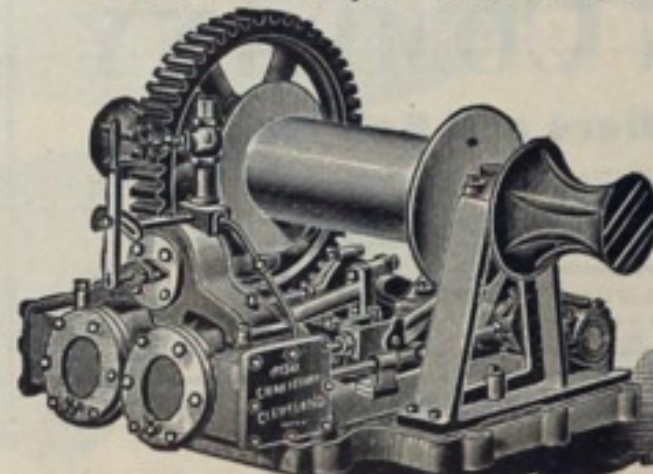
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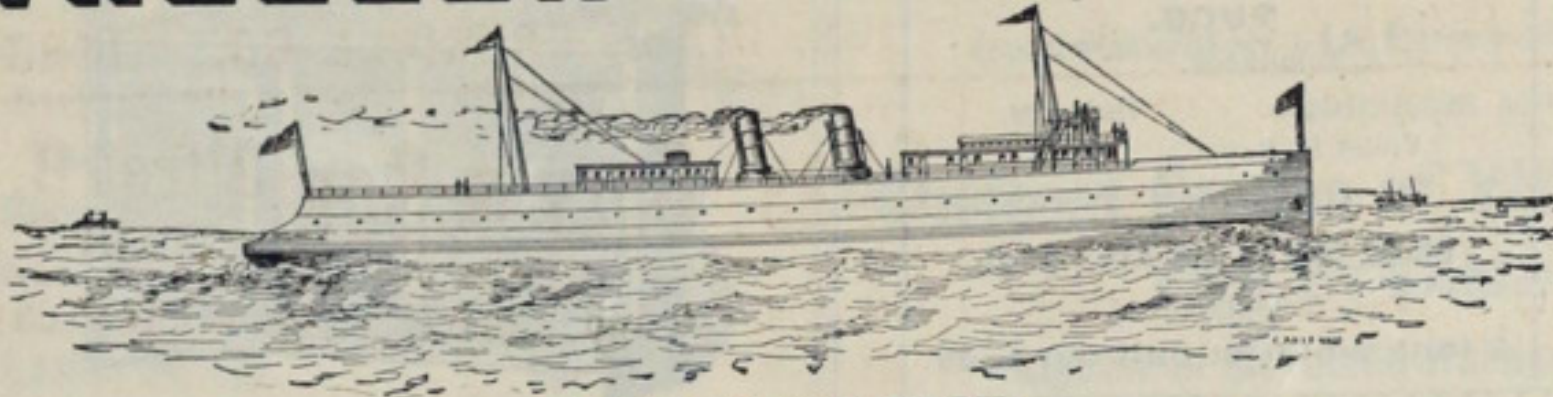
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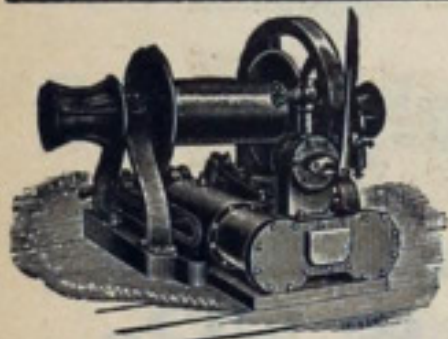
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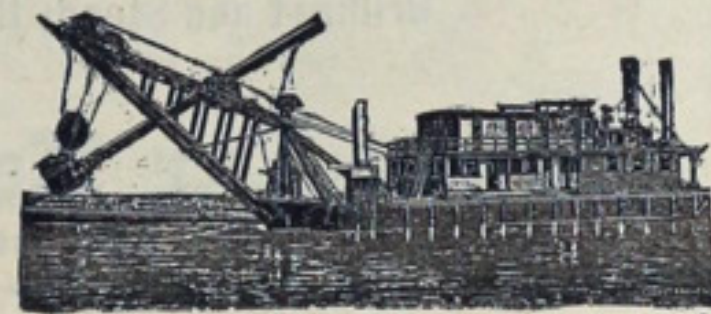
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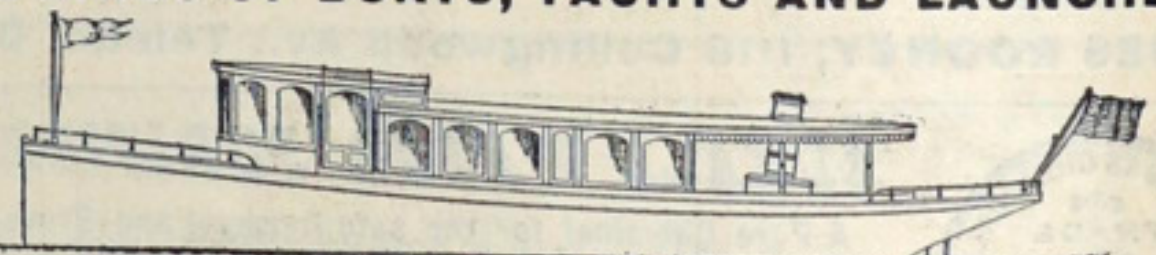
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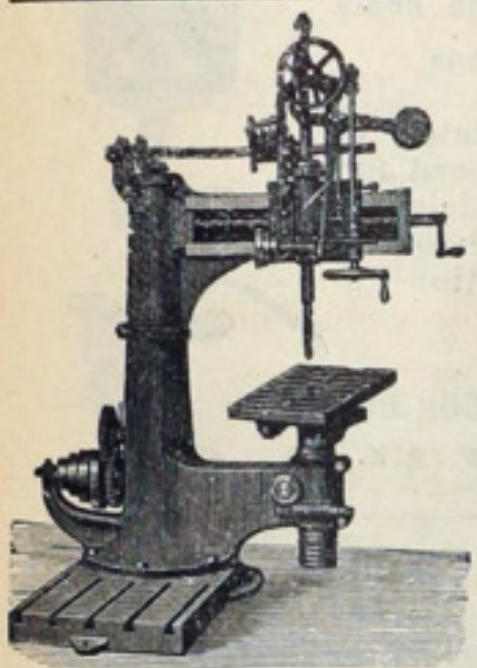
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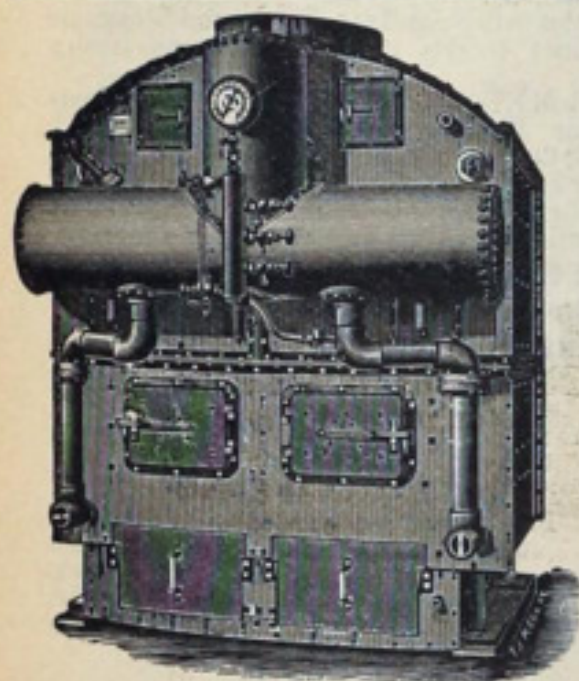
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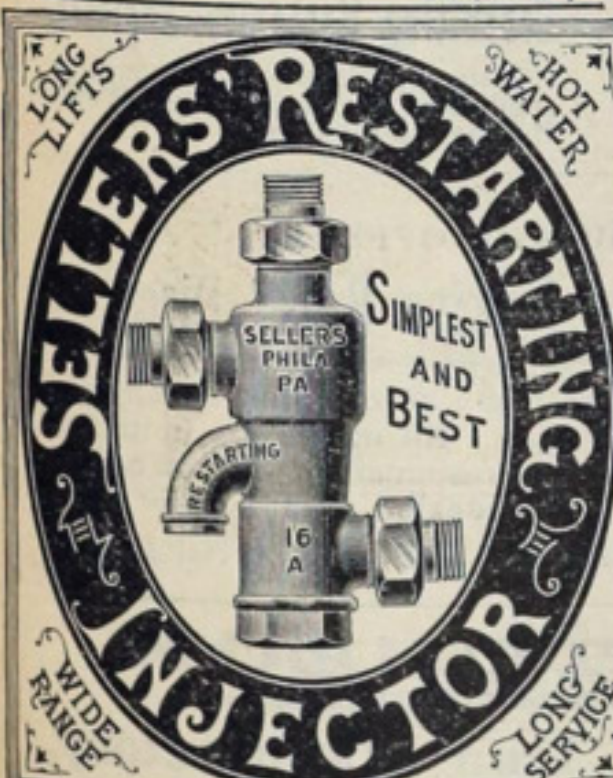
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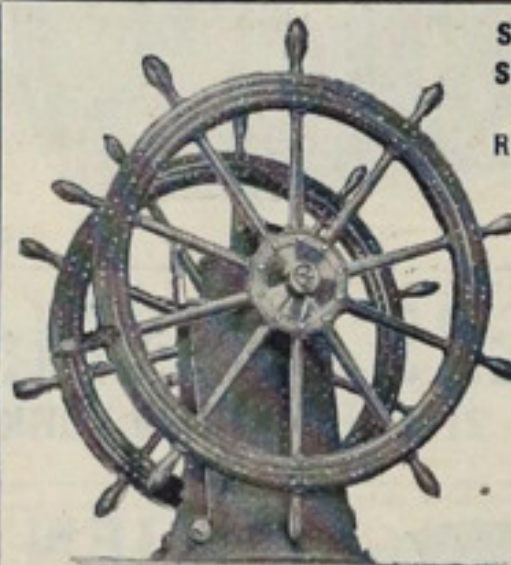
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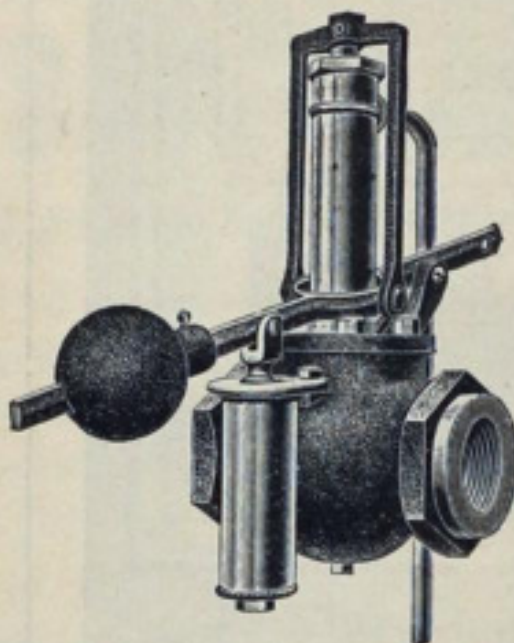
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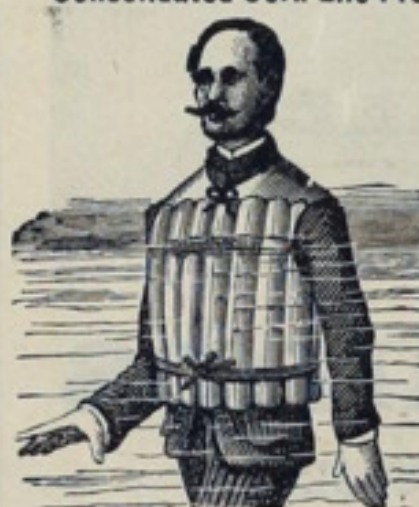
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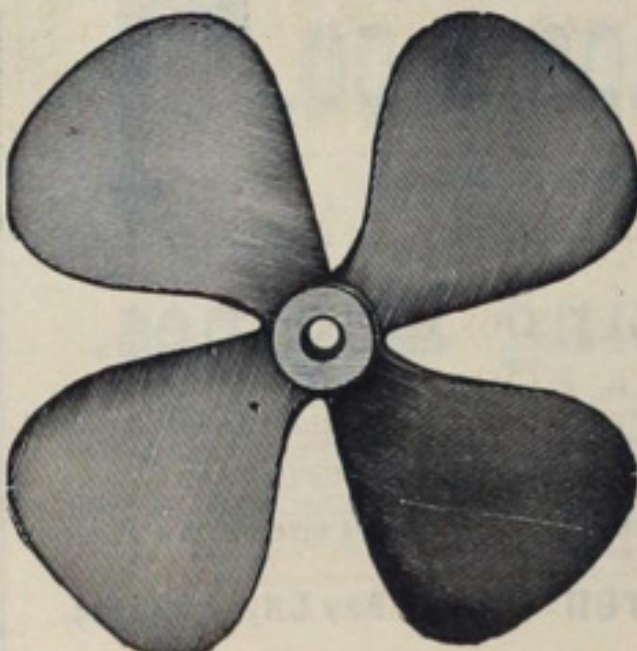
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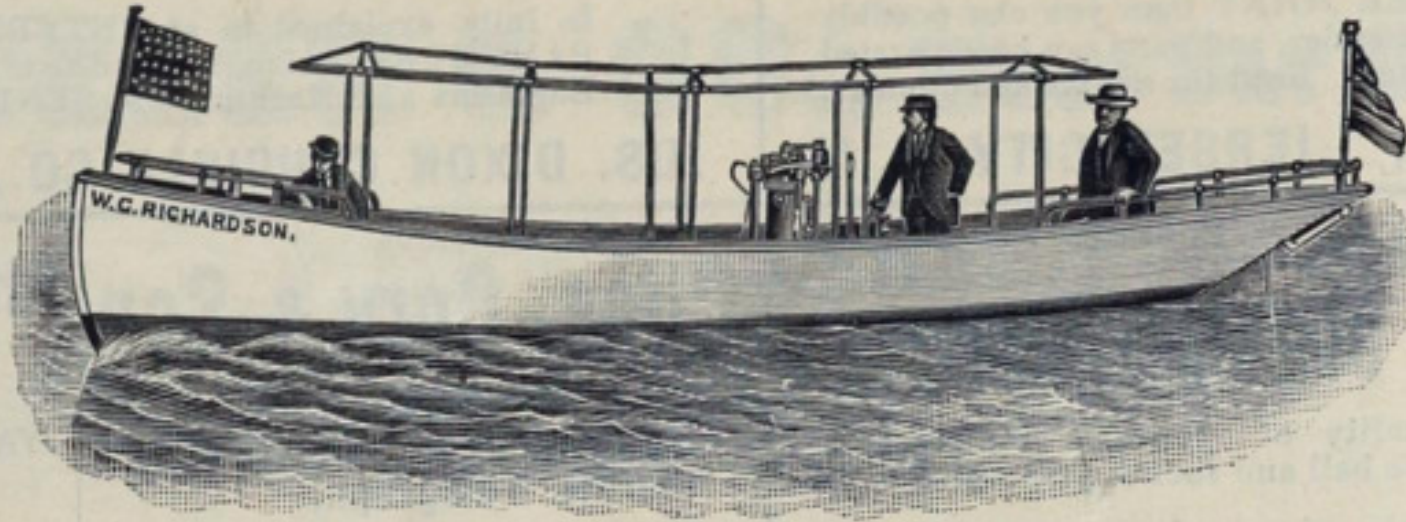


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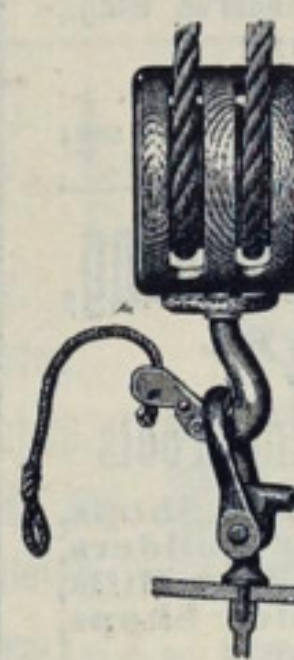
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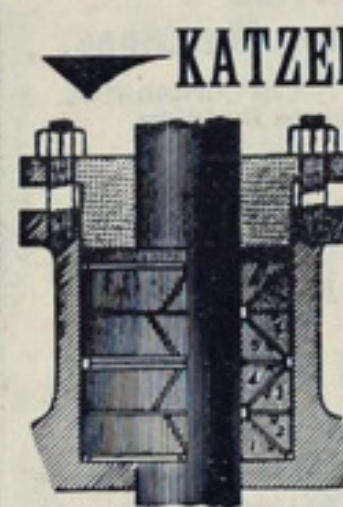
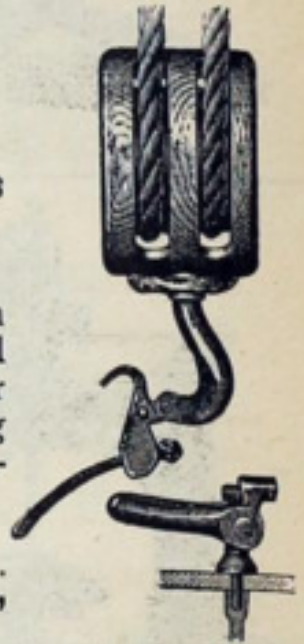


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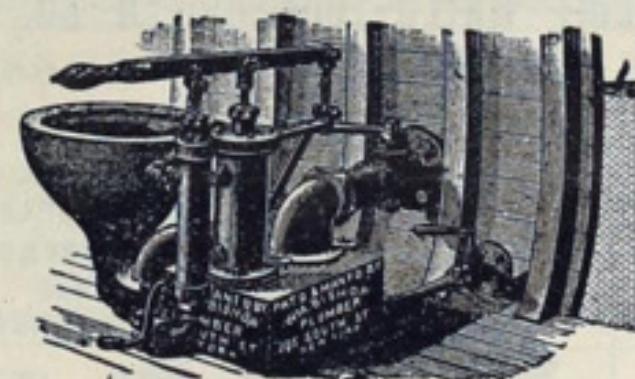
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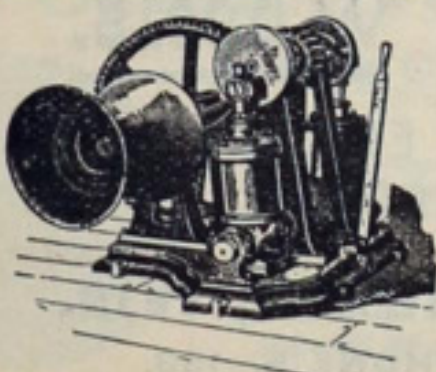
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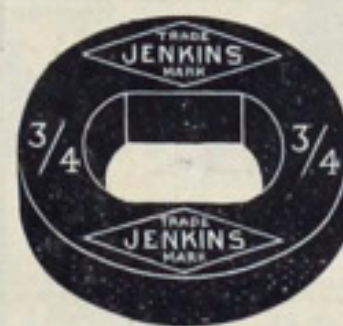
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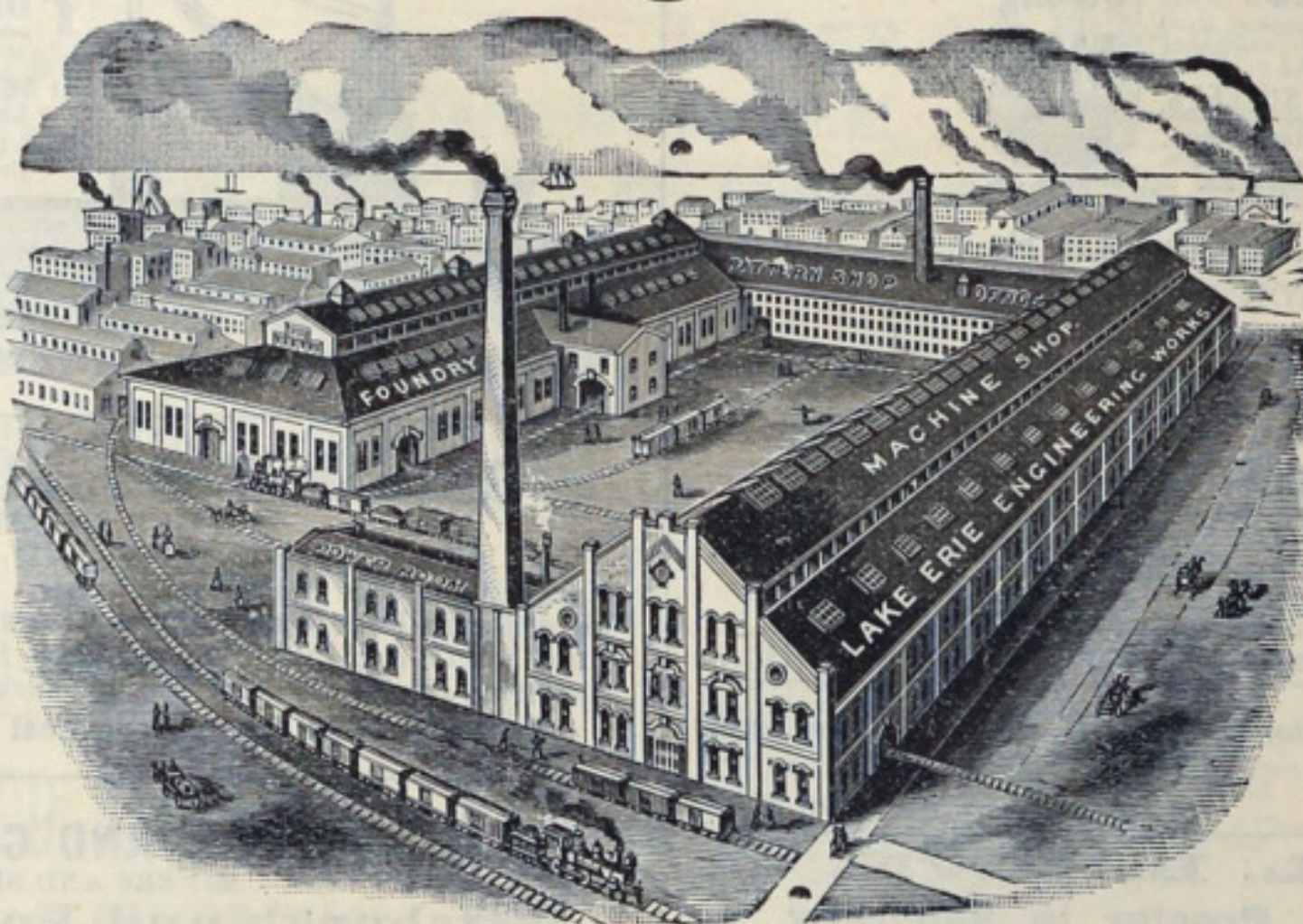
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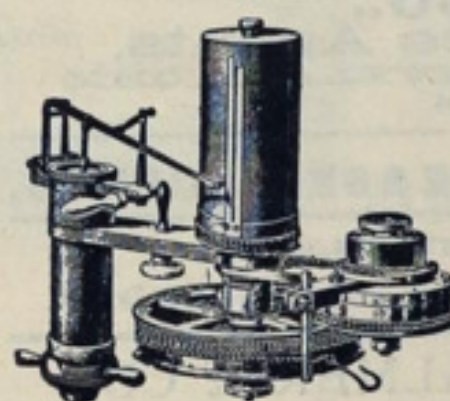
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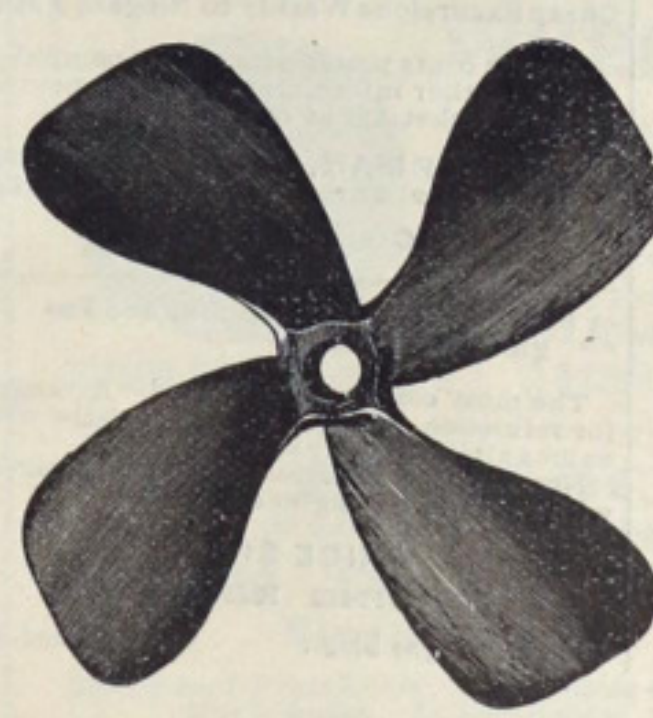
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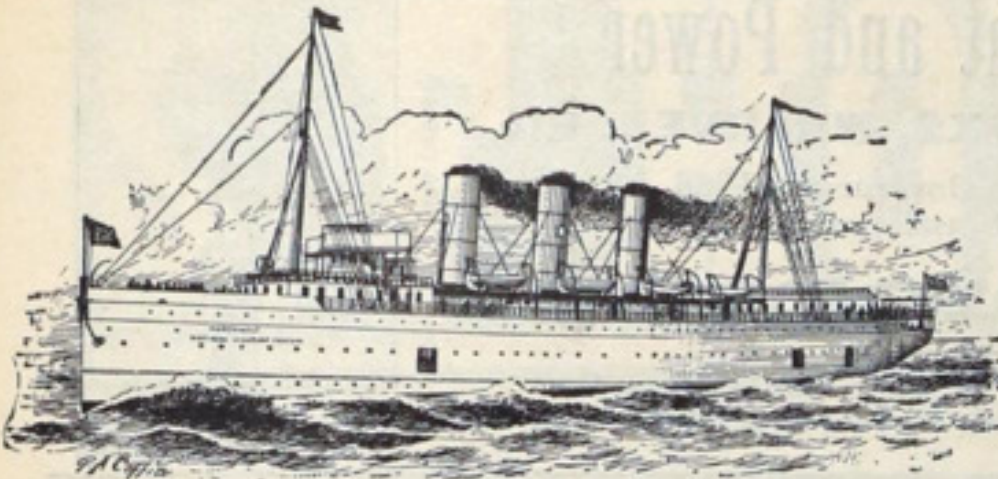
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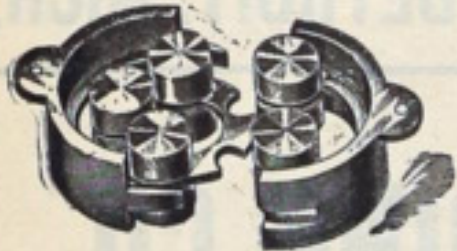
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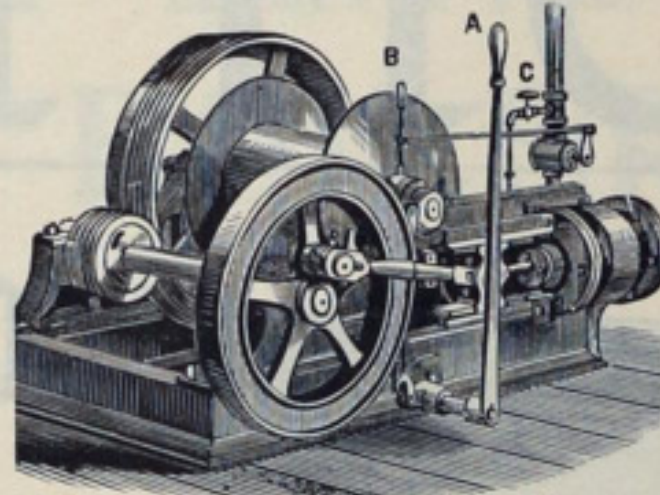
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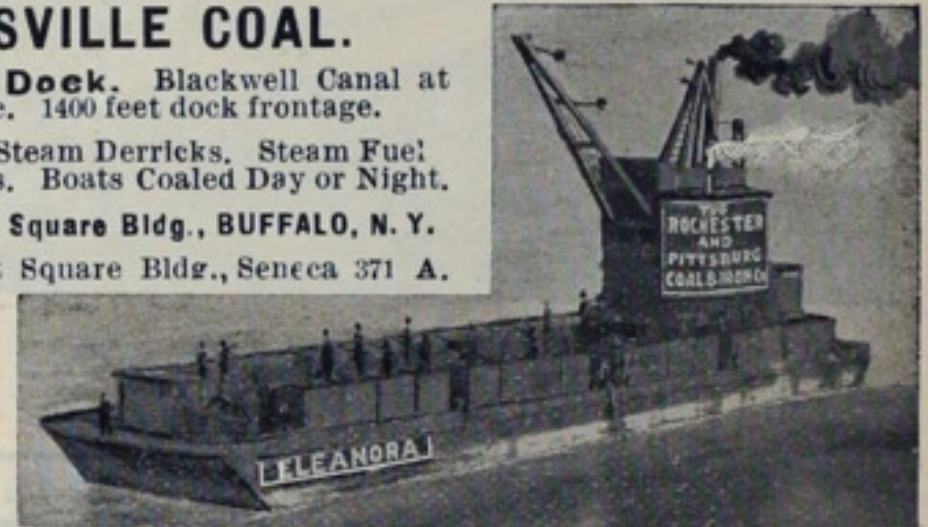
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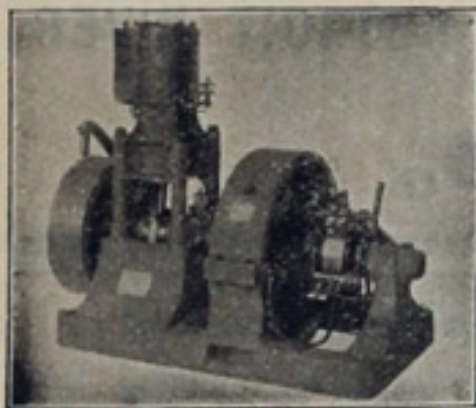
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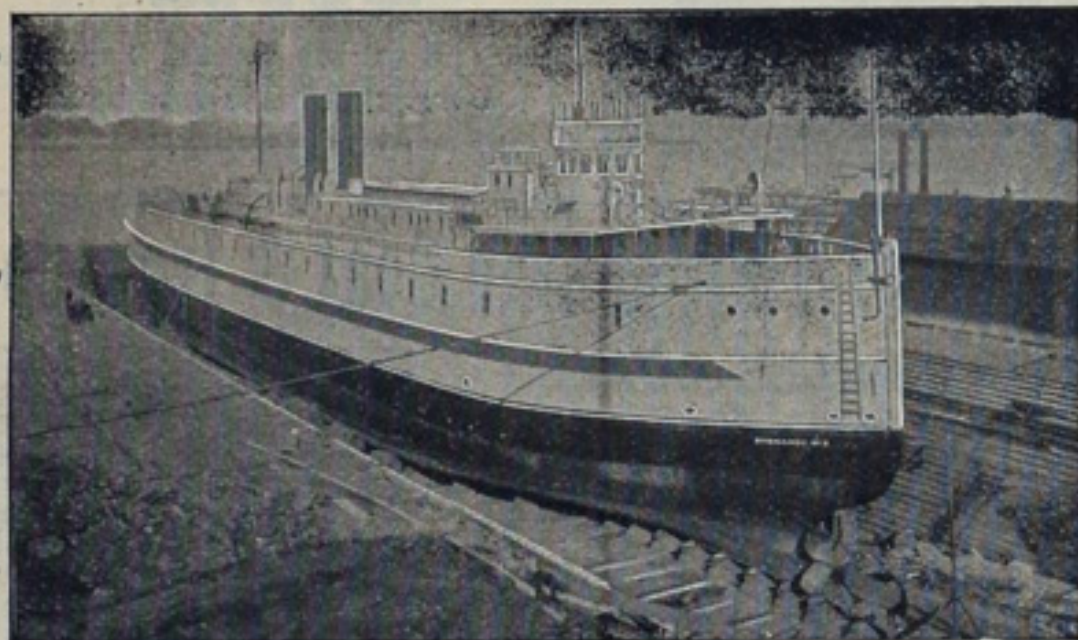
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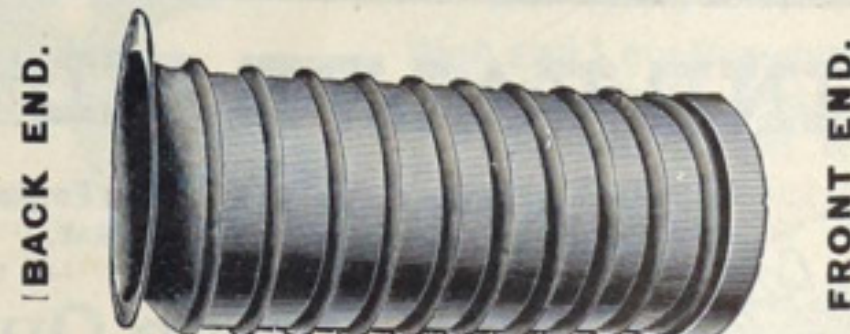
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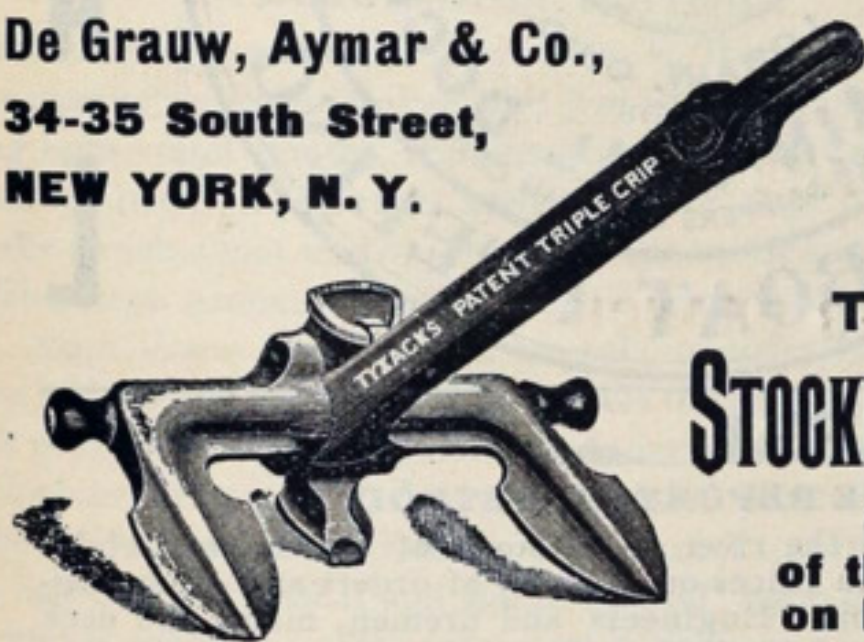
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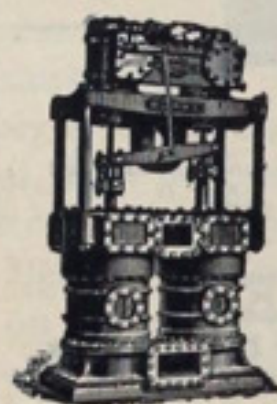
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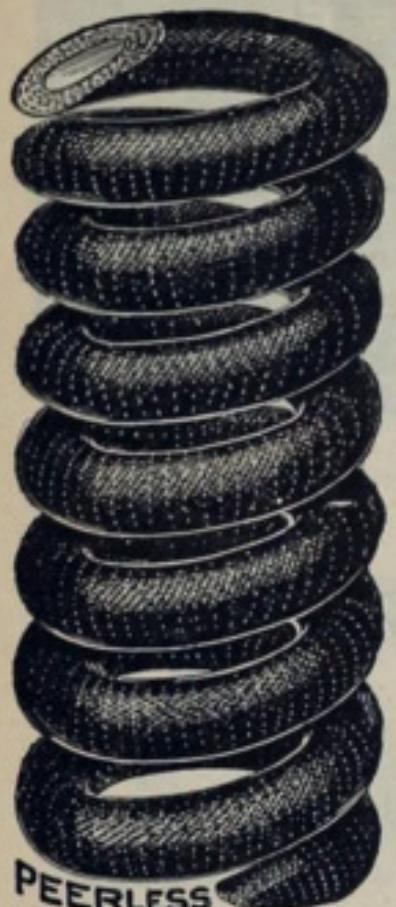
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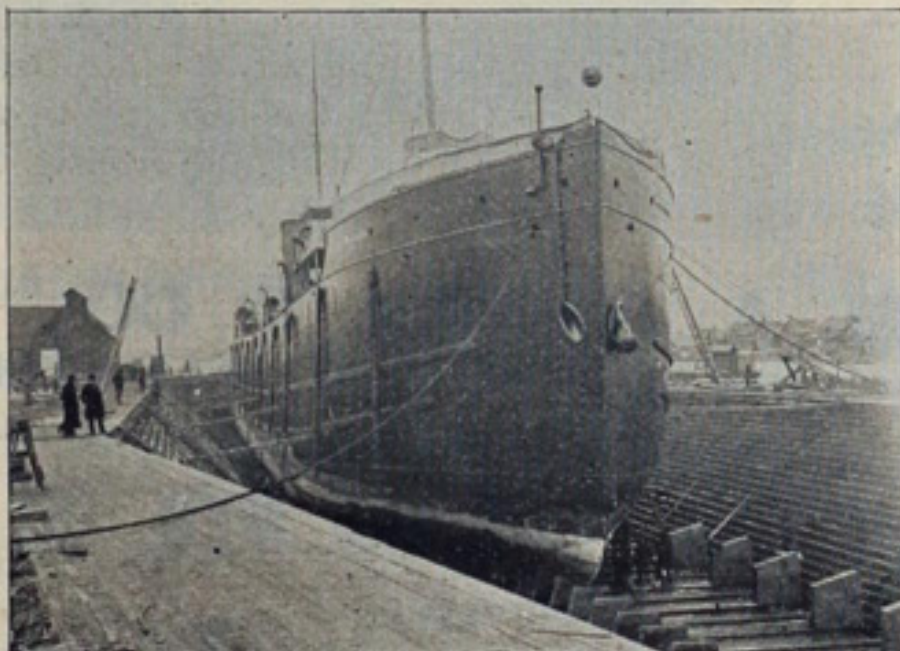
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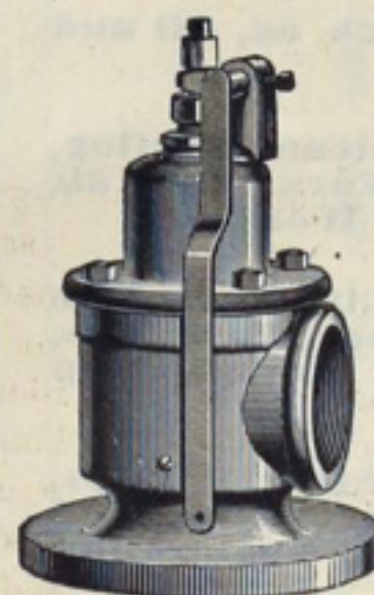
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